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**NAVAL AIR  
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WARMINSTER, PA. 18974

REPORT NO., NADC 73235-30

15 NOVEMBER 1973

NAVAIRDEVcen GRAPHITE-EPOXY COMPOSITE WING  
FOR BQM-34E; STRESS AND VIBRATION ANALYSIS

FINAL REPORT

AIRTASK NO. A320000/001B/4F41422206  
WORK UNIT HJ 202

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

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DEPARTMENT OF THE NAVY  
NAVAL AIR DEVELOPMENT CENTER  
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A weight saving of 54 percent has been achieved in the in-house design and fabrication of a composite wing for the BQM-34E aerial target vehicle. Design criteria are identical to those of the 5g production metal wing. Results of the stress analyses indicate adequate margins of safety.

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## INTRODUCTION

The Naval Air Development Center (NAVAIRDEVCEN) has recently completed the design, analysis, fabrication and static testing of a graphite-epoxy composite wing for the unmanned BQM-34E aircraft. A weight saving of 54 percent has been achieved while meeting all static strength and static and dynamic aeroelastic requirements.

The BQM-34E is a high-altitude, supersonic, recoverable aerial target vehicle. The wing has a 9-foot span and an aspect ratio of 2.5. Other dimensions are shown in Figure 1. The main panel of the production design consists of chem-milled stainless steel skins bonded to an aluminum honeycomb core. The outboard panels are made of fiberglass-reinforced plastic. With the exception of the outboard panels, the entire wing is factory-assembled by adhesive bonding and riveting. Its total weight is 157 pounds, about 30 percent of the structural weight of the aircraft.

In the composite wing design, emphasis was placed on reducing the weight and the number of major subassemblies while maintaining the original airfoil shape and planform. The development was initiated under Independent Research (reference (a)) as an in-house effort whose objectives were to exploit the improved material properties of advanced filamentary reinforced composites, to obtain an optimum design with minimum weight and to allow acquisition of service experience on a primary structural component of a high performance vehicle with no risk to human life. The final design, analysis, fabrication and testing of the wing were carried out entirely in-house under reference (b). Following the successful static testing at NAVAIRDEVCEN, flight testing commenced at the Naval Missile Center (NAVMISCEN), Point Mugu, Ca.

Results of static and flutter analyses of a preliminary wing design have been reported previously in references (c) and (d). The static aeroelastic and flutter analyses and static test of the final design are described and their results presented in references (e) and (f). This report presents the procedure and results of the final stress and vibration analyses and includes the following:

- a. composite and core material characteristics including material stiffness properties and allowable stresses;
- b. descriptions of the wing structure and the finite element model used for the analyses;
- c. results of the stress and vibration analyses;
- d. computation of critical stresses and margins of safety for the skins and core.

## DESIGN CRITERIA

The flight conditions for the composite wing are the same as for the production metal wing, and are described in reference (g), in which the critical flight conditions and the resulting shear, torque and bending loads are presented. The equivalent static test loads are specified in reference (h).

The exposed planform and aerodynamic profile of the composite wing are identical to those of the metal wing. Size and location of fuselage attachment bolts are the same to allow installation of the wing without modification of the fuselage. In addition, the maximum airfoil section depth is limited to 1.62 inches. Finally, to facilitate manufacture, reduce vulnerability to accidental damage, and maintain balance of the laminate, the minimum composite skin thickness has been set at five plies (0.030 in.).

Sufficient stiffness of the wing is required to preclude static and dynamic aeroelastic instabilities throughout the flight envelope. A discussion and analyses of these effects are contained in reference (e).

Stiffness and strength properties of the unidirectional graphite-epoxy material and of the several laminate constructions used in the wing, as well as those of the core materials are listed in Table I. Since, in general, advanced composites exhibit little static yielding, strength calculations for the laminated skins are based solely on ultimate stresses. For the unmanned aircraft, ultimate loads are 25 percent over limit.

## DESCRIPTION OF WING STRUCTURE

The principal features of the composite wing construction are shown in Figure 2. Laminated graphite-epoxy skins, varying in thickness from 5 to 30 plies (.030 to .180 in.), are adhesive bonded to the aluminum honeycomb core. The laminate construction varies over the planform. The number of plies of each orientation is varied to meet local stiffness and strength requirements and to maintain balanced construction. In the center section and in the outboard two-thirds of the exposed span, the core density is  $4.5 \text{ lb./ft.}^3$ . Inboard, where shear loads are higher, and particularly in the vicinity of the attachments, higher density core materials ( $6.1$ ,  $8.1$  and  $23.0 \text{ lb./ft.}^3$ ) are used. The leading edge is a molded solid section of chopped fiber covered by a four-ply,  $\pm 45^\circ$  laminated skin.

To close out the center section and the fuselage interface, and to distribute the attachment bolt reaction loads, channel sections of  $\pm 45^\circ$  construction are placed in the core. Attachment bolt loads are transferred to the adjoining structure by means of titanium flanges bonded

inside the skins and spool-shaped aluminum fittings inserted into the core. Across the aft end of the center section, where the bending moment is highest and the attachment bolt load is most critical, the graphite-epoxy laminated skins are replaced by titanium plates, step-lap bonded to the adjoining laminates. Finally to accommodate electrical wiring for the wing tip antenna, a fiberglass conduit is enclosed within the core between the forward edge of the center section and the wing tip, where mounting holes for the tip antenna pod are provided.

#### FINITE ELEMENT MODELLING AND ANALYSIS

A diagram of the finite element model assembled for analysis using NASTRAN is shown in Figure 3. Triangular and quadrilateral orthotropic plate elements are used to represent the skins and core. The stiffness (bending and transverse shear) and mass properties of each element are derived from the local laminate construction, number of plies, core properties, and the airfoil thickness. The remaining structural elements - leading edge, conduit, channel section ribs and tip antenna pod - are represented by bar elements. In order to accurately simulate the mass distribution of the wing for the vibration analysis, additional lumped masses are placed along the leading edge and tip. A listing of the NASTRAN bulk data deck is reproduced in Appendix A.

For the static analysis, the test loads from reference (h) were distributed over the finite element model as concentrated forces applied to the grid points. To simulate the boundary condition for the critical load condition (5g symmetric pull-up), vertical displacements were constrained for the grid points located at the fuselage attachment bolts, and rotations about the longitudinal axis were constrained along the aircraft center line. The results of the static analysis, including the deflected shape, deflections at selected points, and reaction loads are shown in Figure 4 and Tables II and III. A complete listing of the NASTRAN output data is reproduced in Appendix B.

To provide vibration frequency and mode data for the modal flutter analysis described in reference (e), the real eigenvalue analysis option available in NASTRAN was used. Both symmetric and antisymmetric modes were computed by altering the constraints at the fuselage centerline. Similar frequencies, generalized masses and generalized stiffness resulted for the two cases. These data are listed in Table IV for the first five modes of each case. The mode shapes of the first three symmetric modes are shown in Figures 5, 6 and 7, and of the first three antisymmetric modes in Figures 8, 9 and 10. A complete listing of the NASTRAN output data for the symmetric modes is reproduced in Appendix C.

## STRESS ANALYSIS

To determine the ply stresses in the graphite-epoxy skins, element stresses computed by NASTRAN are first transformed into the local laminate coordinates. The stresses in laminate coordinates are shown for two streamwise sections in Figures 11 and 12. Laminate stiffness properties are used to calculate the resulting strains, which are subsequently transformed for each of the ply orientations of the local laminate construction. Unidirectional material stiffness coefficients are then used to compute the ply stresses. To account for the combined-stress state of the material in determining margins of safety, the interaction formula below is applied:

$$\left(\frac{\sigma_1}{X_1}\right)^2 + \left(\frac{\sigma_2}{X_2}\right)^2 + \left(\frac{\sigma_6}{X_6}\right)^2 - \frac{\sigma_1 \sigma_2}{X_1 X_2} = R^2$$

$$\left| \frac{\sigma_i}{X_i} \right| = R_i \quad i=1,2,6 \quad \text{Ult. M.S.} = \frac{1}{1.25 \times R_{\max}} - 1.$$

where  $\sigma_1, \sigma_2, \sigma_6$  are the inplane normal and shear stresses in the ply and  $X_i$  are the allowable stresses. The margin of safety of the element is the lowest of the margins for the individual ply orientations. The critical elements of the finite element model and the stresses and margins of safety resulting from the static analysis are listed in Table V.

Depending upon the ratio of the skin thickness to the section depth ( $0. \leq t/H \leq 0.5$ ) the core shear stress varies from 1.0 to 1.5 times the average shear stress (force/area), but may be conservatively approximated by the relation

$$\tau \leq \frac{1}{H} \left( 1 + 1.15 \frac{t}{H} \right) \times \text{shear force per unit width}$$

To determine the core shear stresses and margins of safety, the element shear forces (per unit width) from NASTRAN and the skin thickness and section depth at the element centroid are used in the formula above. The resulting stresses are transformed into the ribbon and transverse directions of the core, and the strength criterion below is applied:

$$\frac{\tau_L}{x_L} + \left( \frac{\tau_w}{x_w} \right)^{1.575} = R''$$

$$\text{Ult. M. S.} = \frac{1}{1.25 \times R''} - 1.$$

where the subscripts L and W refer to the ribbon and transverse directions respectively. Shear stresses and margins of safety for the critical elements of the model are shown in Table VI.

The minimum ultimate margins of safety calculated for skins and core are 0.14 and 0.32 respectively. Therefore, the wing is considered safe for flight.

CONCLUSIONS

1. Based on the static aerodynamic loads prescribed, adequate margins of safety have been provided for the skins and core of the graphite-epoxy composite wing designed and fabricated for the BQM-34E target vehicle.
2. Static and dynamic aeroelastic (flutter) analyses, reviewed in reference (e), indicate that the stiffness and mass distribution of the composite wing are sufficient to avoid any instabilities throughout the flight envelope.

REFERENCES

- (a) Independent Research R011-01-01, Work Unit ME-9-02, Structural Research Program
- (b) AIRTASK No. A320000/001B/4F41422206, Work Unit HJ 202
- (c) Neu, T. F.: Graphite-Epoxy Composite Wing for BQM-34E; Design Criteria and Analysis. NAVAIRDEVCE Report No. AM-7023, 21 October 1970.
- (d) Somoroff, A. R.: Graphite-Epoxy Composite Wing for BQM-34E; Flutter and Stress Analysis. NAVAIRDEVCE Report No. AM-7024, 28 September 1970.
- (e) Somoroff, A. R. and Rubin, H.: NAVAIRDEVCE Graphite-Epoxy Composite Wing for BQM-34E: Aeroelastic Analysis. NAVAIRDEVCE Report No. 73233-30 of 12 November 1973.
- (f) Minecci, J. and Libeskind, M.: NAVAIRDEVCE Graphite-Epoxy Composite Wing for BQM-34E: Static Test Results. NAVAIRDEVCE Report No. 73244-30 of 3 December 1973.
- (g) Krzyzanowski, A. and Lambert, C. G.: Wing Structural Analysis Report for BQM-34E Supersonic Aerial Target. Ryan Aeronaualtical Company Report No. TRA 16642-12, 6 January 1971.
- (h) Thompson, R. W.: Static Test Program for XBQM-34E Supersonic Aerial Target. Ryan Aeroanautical Company Report No. TRA 16642-4, 2 January 1967.

TABLE I

(a) Composite Material and Laminate Properties

Laminate Construction*				Stiffness Coeficients psi x 10 <sup>6</sup>			
L	M	N	$\alpha$	$Q_{11}$	$Q_{12}$	$Q_{22}$	$Q_{66}$
1	0	0	-	22.12	0.386	1.21	0.60
1	0	4	45°	9.07	3.99	5.30	3.94
2	0	4	45°	10.93	3.39	4.65	3.70
4	0	6	45°	11.86	3.09	4.32	3.40
8	0	2	45°	17.43	1.29	2.34	1.60
2	0	4	22½°	16.88	1.89	1.70	2.20

\*L = No. of 0° plies; M = No. of 90° plies; N = No. of  $\pm\alpha$  plies.

Unidirectional material allowable ultimate stresses:

$$X_1 = 81.0 \text{ ksi} \quad X_2 = 3.6 \text{ ksi} \quad X_6 = 4.05 \text{ ksi}$$

based on average results of specimen tests reduced by 55%: 20% for statistical variation; 20% for possible required repair; and 15% for environmental degradation.

(b) Honeycomb Core Properties

Density, lb./ft. <sup>3</sup>	Shear Modulus, ksi		Shear Strength, psi	
	Long.	Transv.	Long.	Transv.
4.5	70	28	350	205
6.1	102	38	525	305
8.1	143	51	740	440

TABLE II

STATIC DEFLECTION AT SELECTED POINTS

<u>GRID PT.</u>	<u>DEFLECTION (IN.)</u>
1	0.01
6	0.87
10	5.13
11	-0.01
18	1.11
22	5.41
35	-0.05
42	1.64
46	5.98
59	-0.10
66	2.15
70	6.51
81	-0.03
85	1.91
90	7.16

TABLE III

(a) Attachment Bolt Loads

<u>Grid Pt.</u>	<u>Load (lb.)</u>
13	- 331.2
25	- 277.0
37	106.7
49	2163.5
61	<u>3204.7</u>
TOTAL	4866.7

(b) Centerline Bending Moment

<u>Grid Pt.</u>	<u>Moment (in.-lb.)</u>
11	4129.4
23	12770.5
35	25466.2
47	28630.0
59	14849.9
101	<u>18499.0</u>
TOTAL	104345.0

TABLE IV  
VIBRATION MODE DATA

MODE NO.	FREQUENCY (HZ)	GENERALIZED MASS (lb.-in.-sec <sup>2</sup> )	GENERALIZED STIFFNESS (lb.-in.)
<b>(a) Symmetric</b>			
1	20.2	.00476	76.5
2	69.3	.00281	532.5
3	85.6	.00250	724.7
4	135.1	.00344	2479.2
5	143.4	.00160	1298.8
<b>(b) Antisymmetric</b>			
1	20.6	.00464	77.4
2	71.5	.00266	535.7
3	85.9	.00241	702.9
4	138.6	.00381	2892.3
5	144.7	.00206	1703.3

TABLE V  
LAMINATE STRESS DATA AT LIMIT LOAD

El. No.	Laminate Stresses, psi			Crit. Ply Orient.	Stresses in Critical Ply, psi			Ult. M.S.
	$\sigma_x$	$\sigma_y$	$\gamma_{xy}$		$\sigma_1$	$\sigma_2$	$\sigma_6$	
52	22228	2290	-2906	0°	46826	-379	-513	.23
53	22614	2567	-4084	0°	47277	-311	-721	.22
54	22442	2098	-2967	0°	47604	-450	-524	.19
55	20732	1636	-3500	0°	44440	-511	-618	.23
56	20558	1264	-1974	0°	44615	-619	-348	.22
57	21406	3254	-5277	0°	49415	-267	-856	.17
73	23369	2933	-4899	0°	48424	-233	-865	.20
74	23681	2951	-3808	0°	49103	-243	-672	.21
75	23793	2669	-4762	0°	49789	-337	-841	.14
76	23329	2571	-3262	0°	48888	-345	-576	.19
77	22371	2105	-4044	0°	47433	-444	-714	.18
78	19743	2503	-2368	0°	46473	-397	-384	.25
79	21514	3554	-5030	0°	49154	-183	-816	.20

TABLE VI

## CORE SHEAR STRESS DATA AT LIMIT LOAD

El. No.	Core Density lb./ft. <sup>3</sup>	Shear Stresses, psi		Ult. M.S.
		Ribbon Dir.	Transverse	
51	4.5	83.	47.	1.40
52	4.5	102.	28.	1.38
68	6.1	99.	157.	0.49
69	8.1	284.	169.	0.32
70	6.1	164.	46.	1.20
73	4.5	110.	33.	1.16
74	4.5	113.	18.	1.33
75	4.5	111.	21.	1.33
92	6.1	167.	27.	1.35
700	6.1	173.	94.	0.65
900	8.1	206.	116.	0.99

AIRFOIL: NACA 65-003  
 (MODIFIED) LINEAR TAPER  
 FROM APPROX. .68C TO  
 FINITE THICKNESS  
 TRAILING EDGE

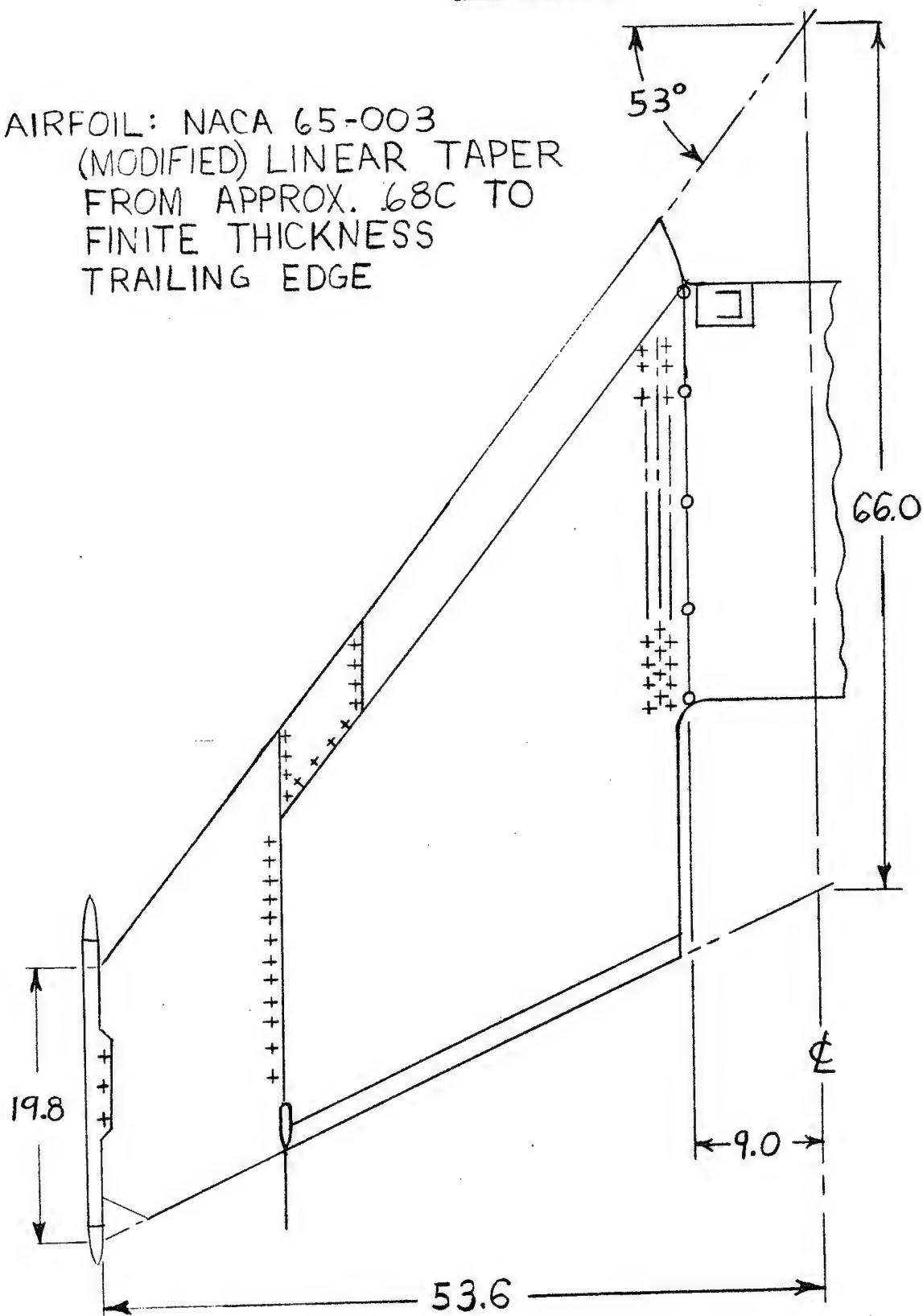


FIGURE 1. BQM-34E METAL WING PLANFORM

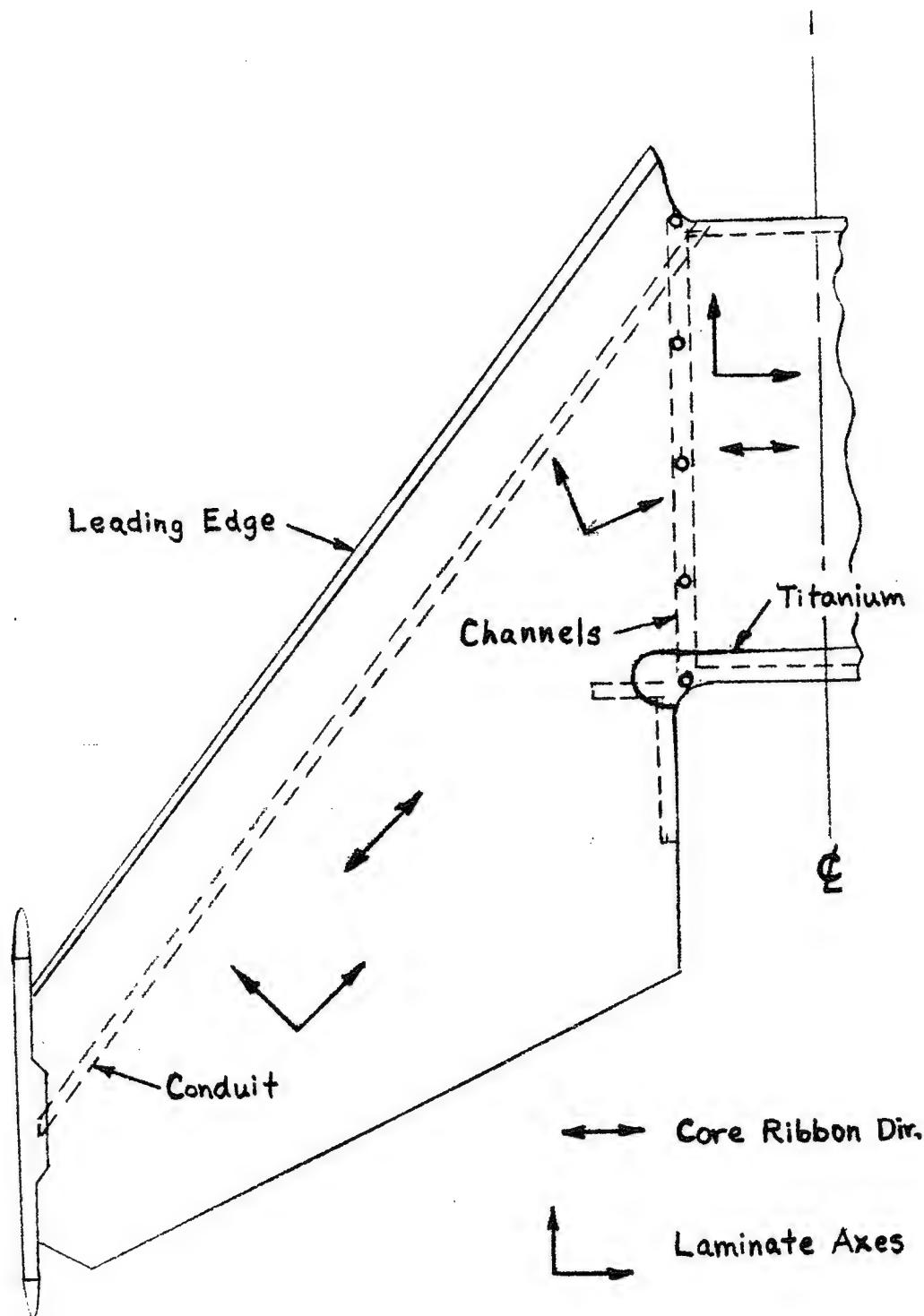


FIGURE 2. COMPOSITE WING CONSTRUCTION

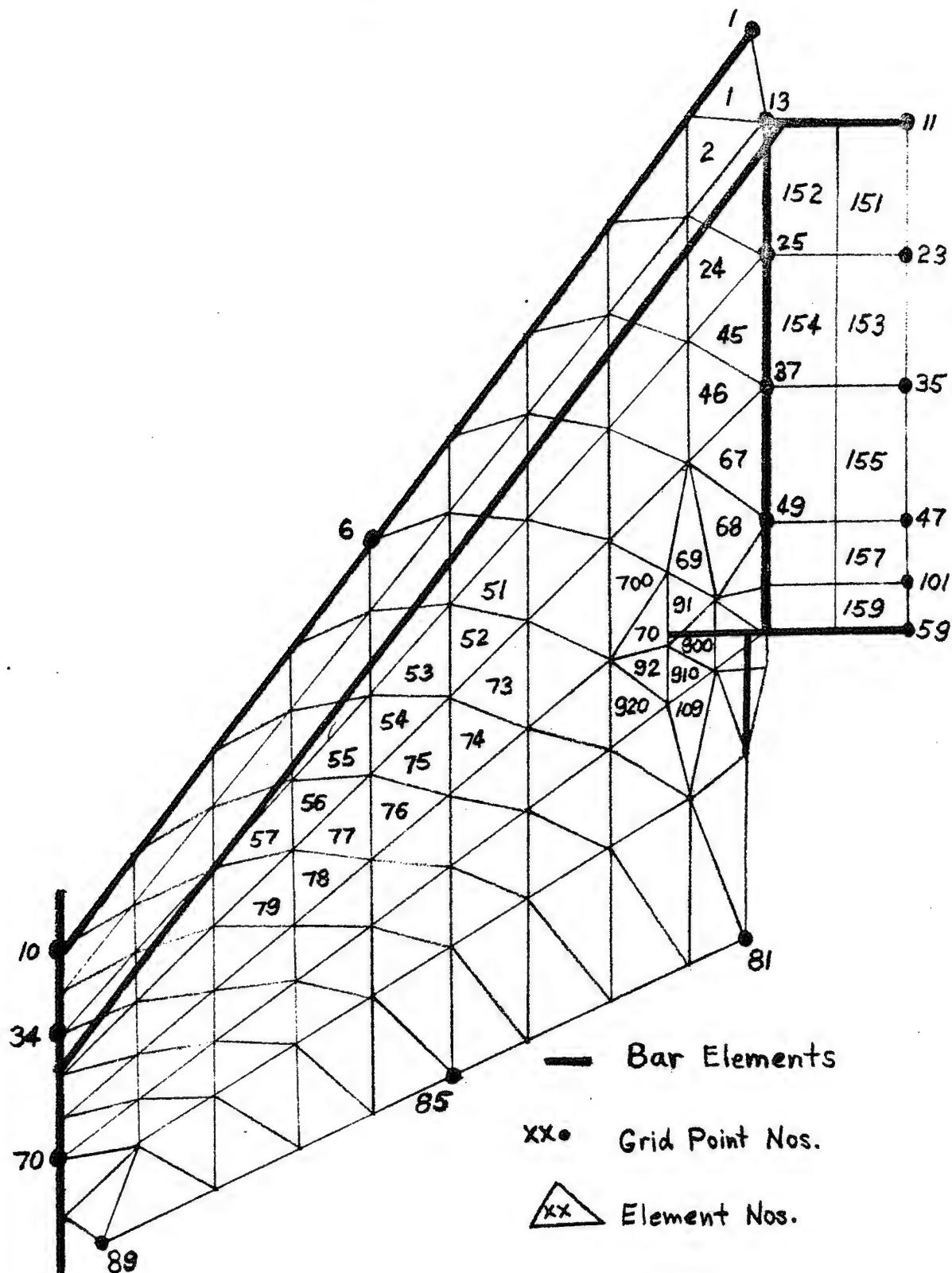


FIGURE 3. NASTRAN FINITE ELEMENT MODEL

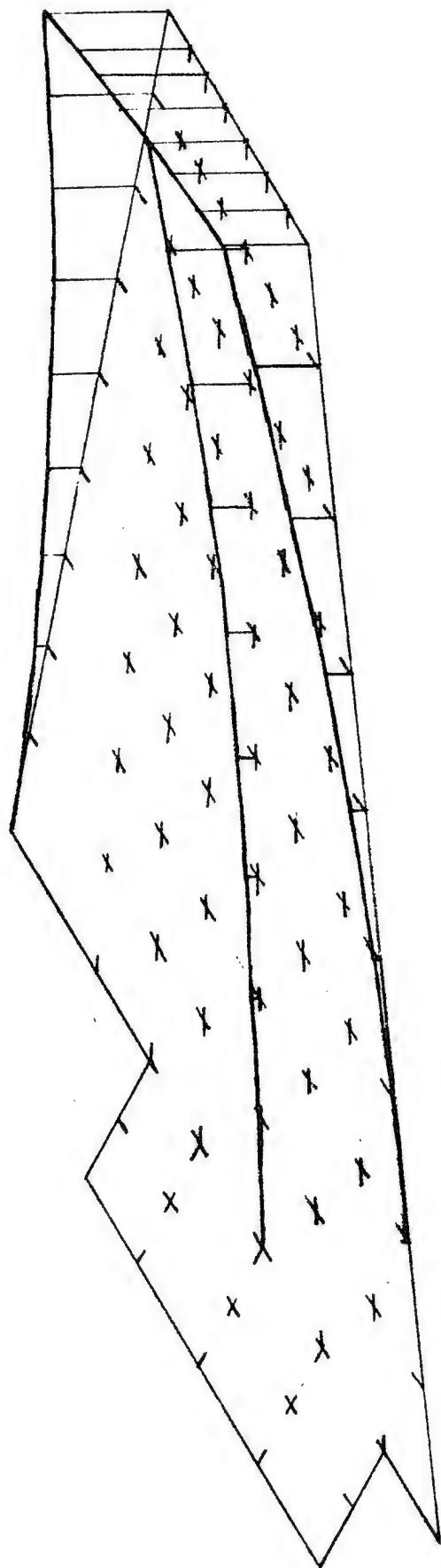


FIGURE 4. STATIC DEFLECTED SHAPE

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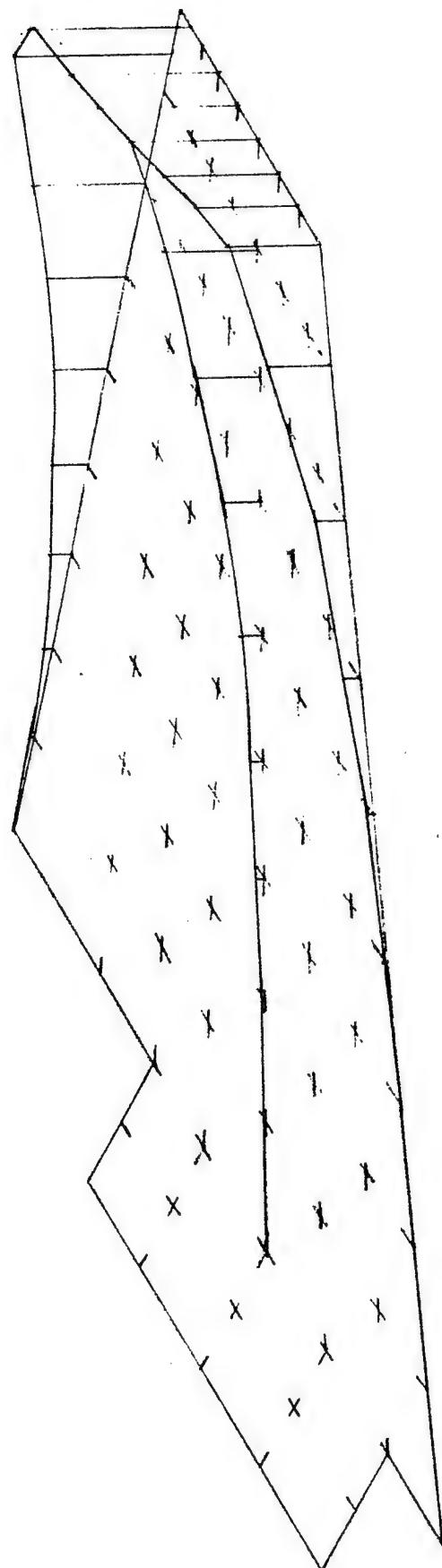


FIGURE 5. FIRST SYMMETRIC MODE, 20.2 HZ

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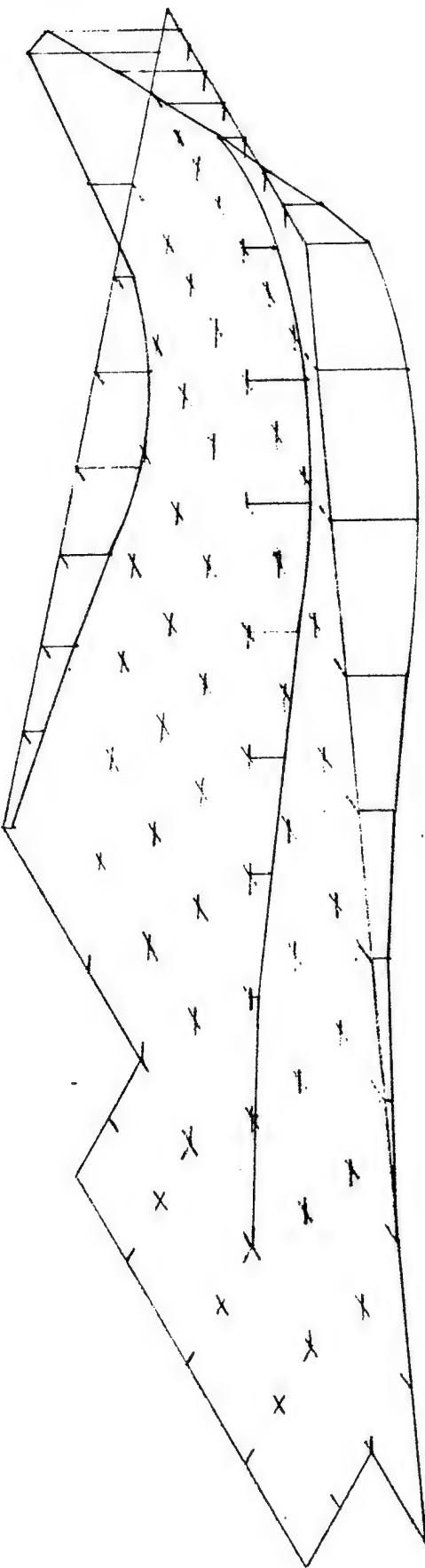


FIGURE 6. SECOND SYMMETRIC MODE, 69.3 Hz

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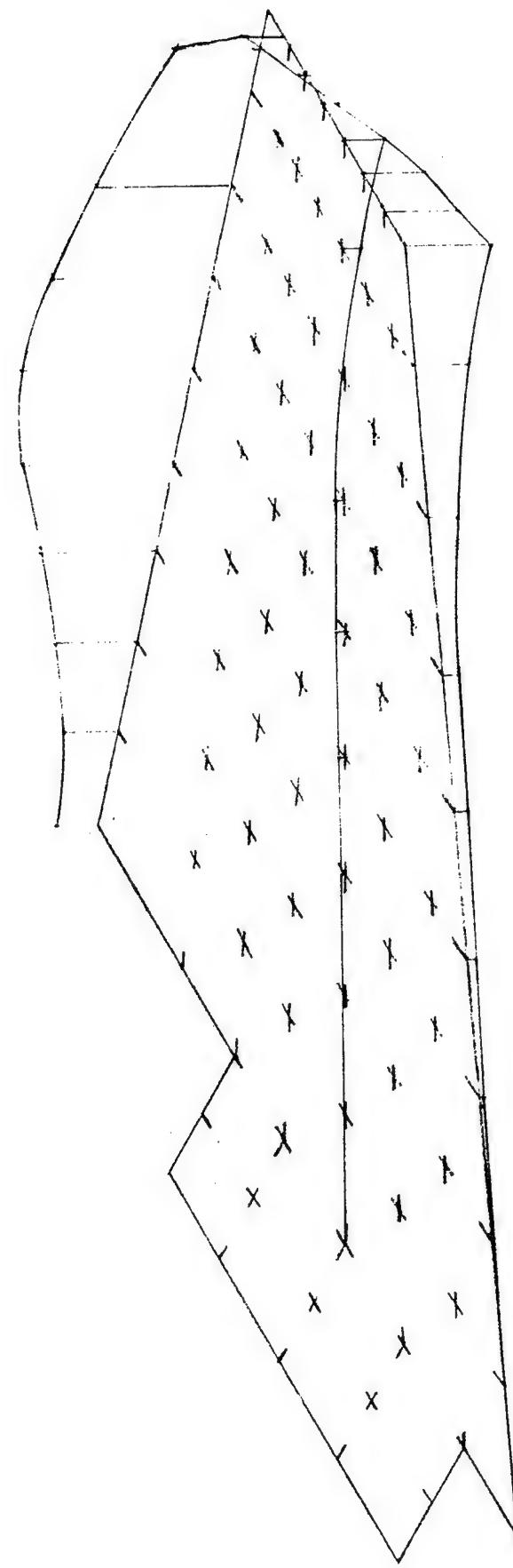


FIGURE 7. THIRD SYMMETRIC MODE, 85.6 KHz

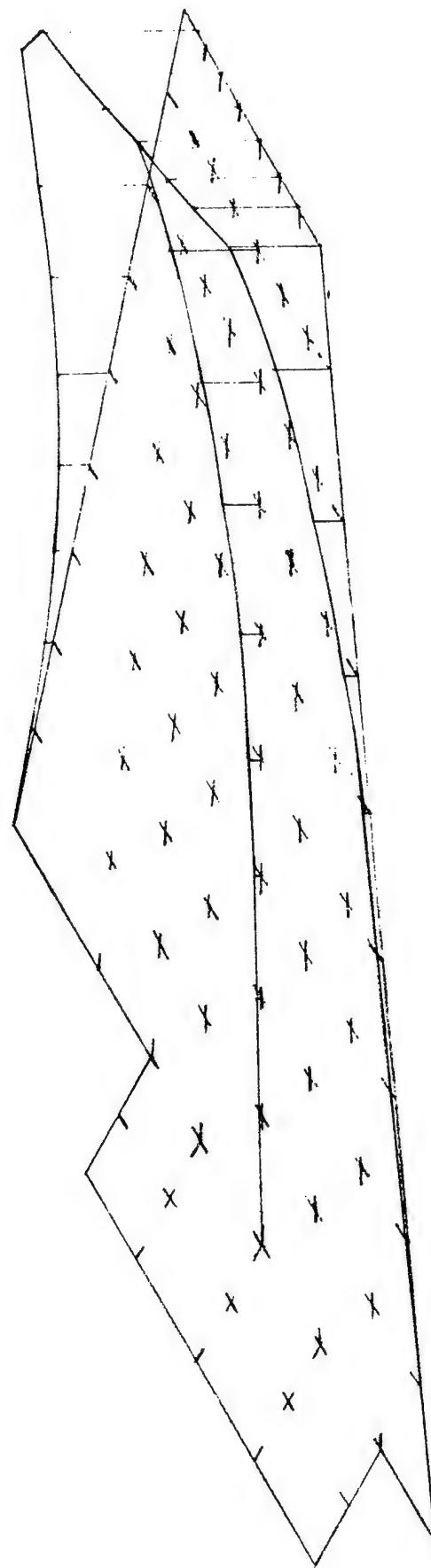


FIGURE 8. FIRST ANTSYMETRIC MODE, 20.6 HZ

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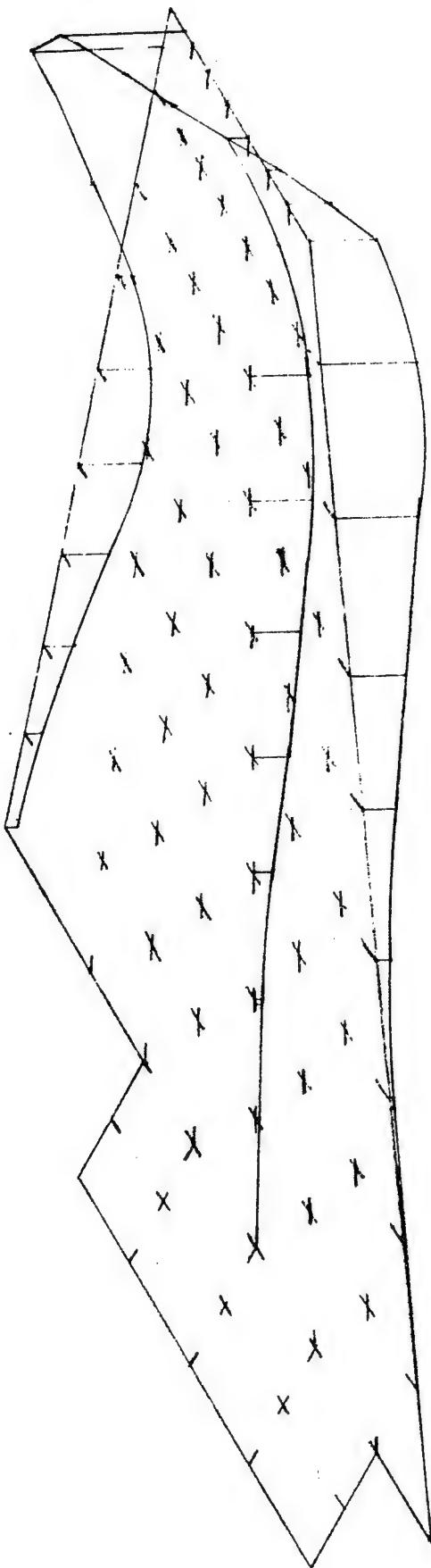


FIGURE 9. SECOND ANTSYMMETRIC MODE, 71.5 HZ

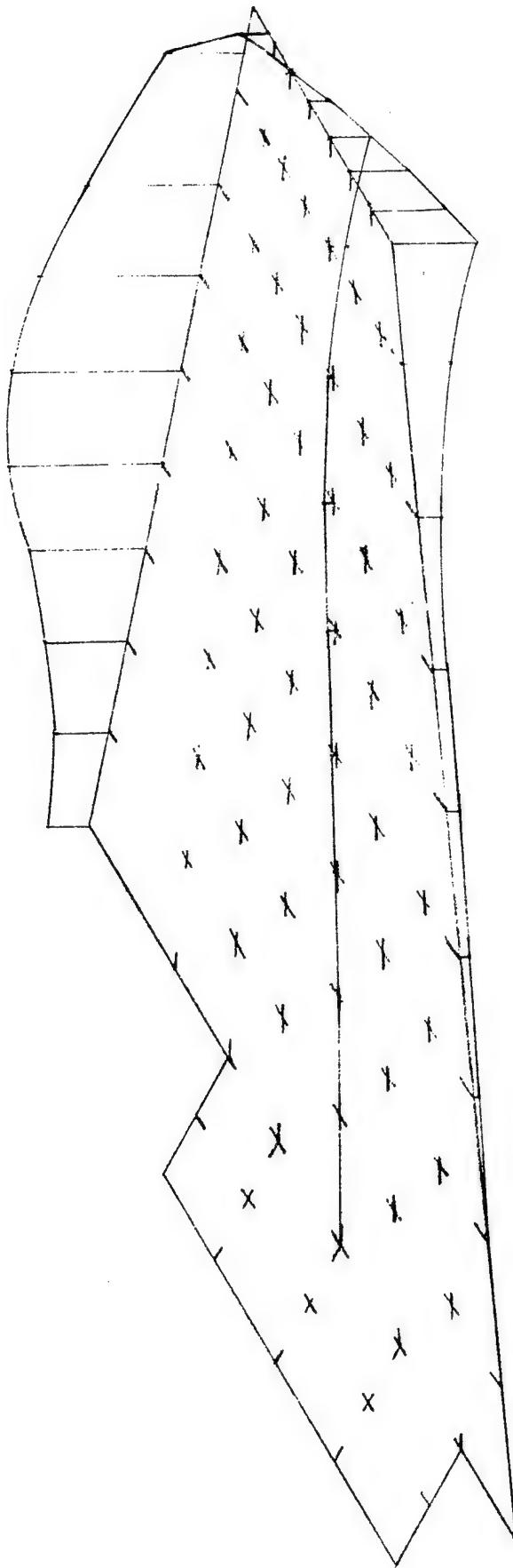


FIGURE 10. THIRD ANTSYMMETRIC MODE, 95.9 HZ

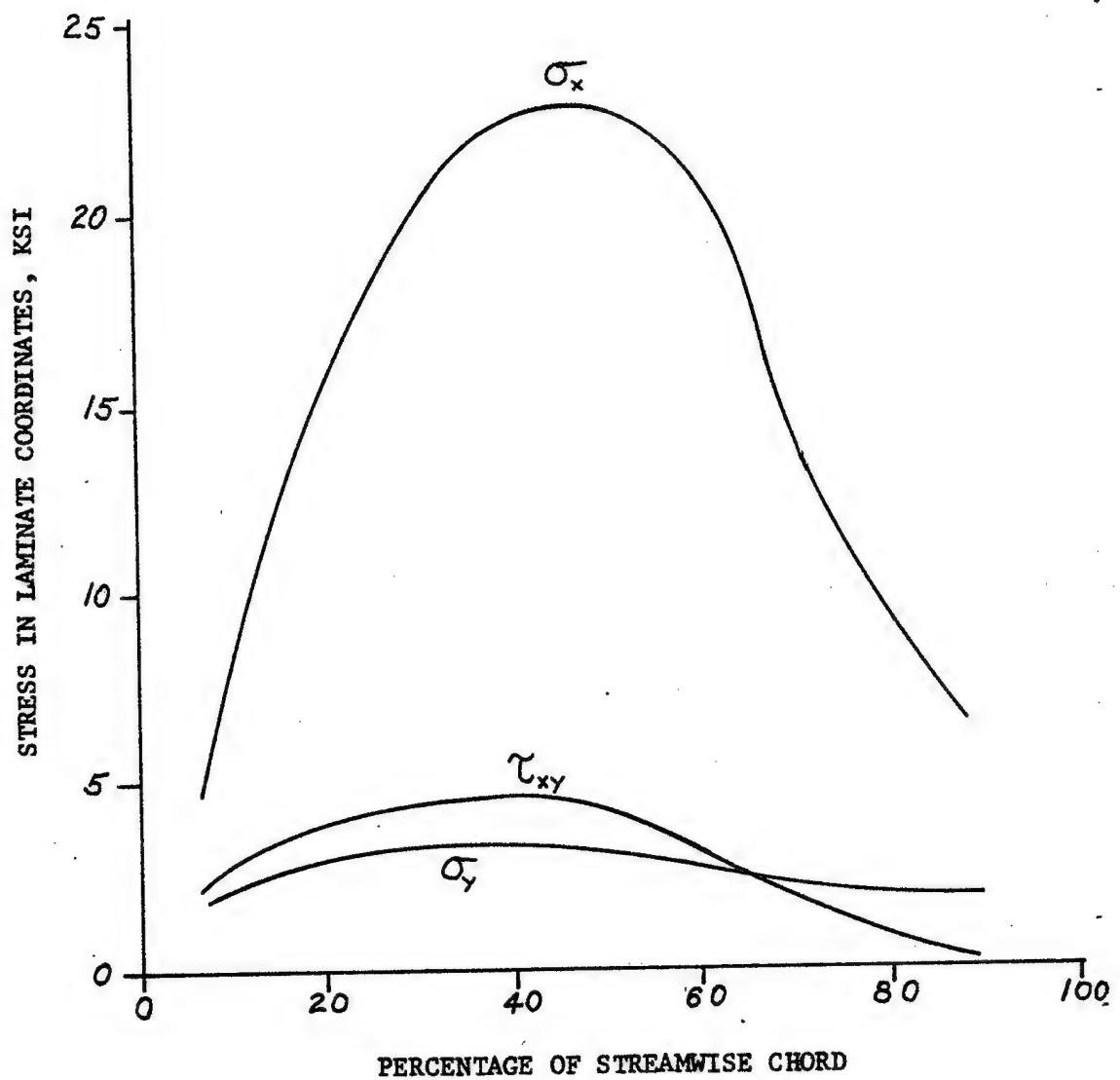
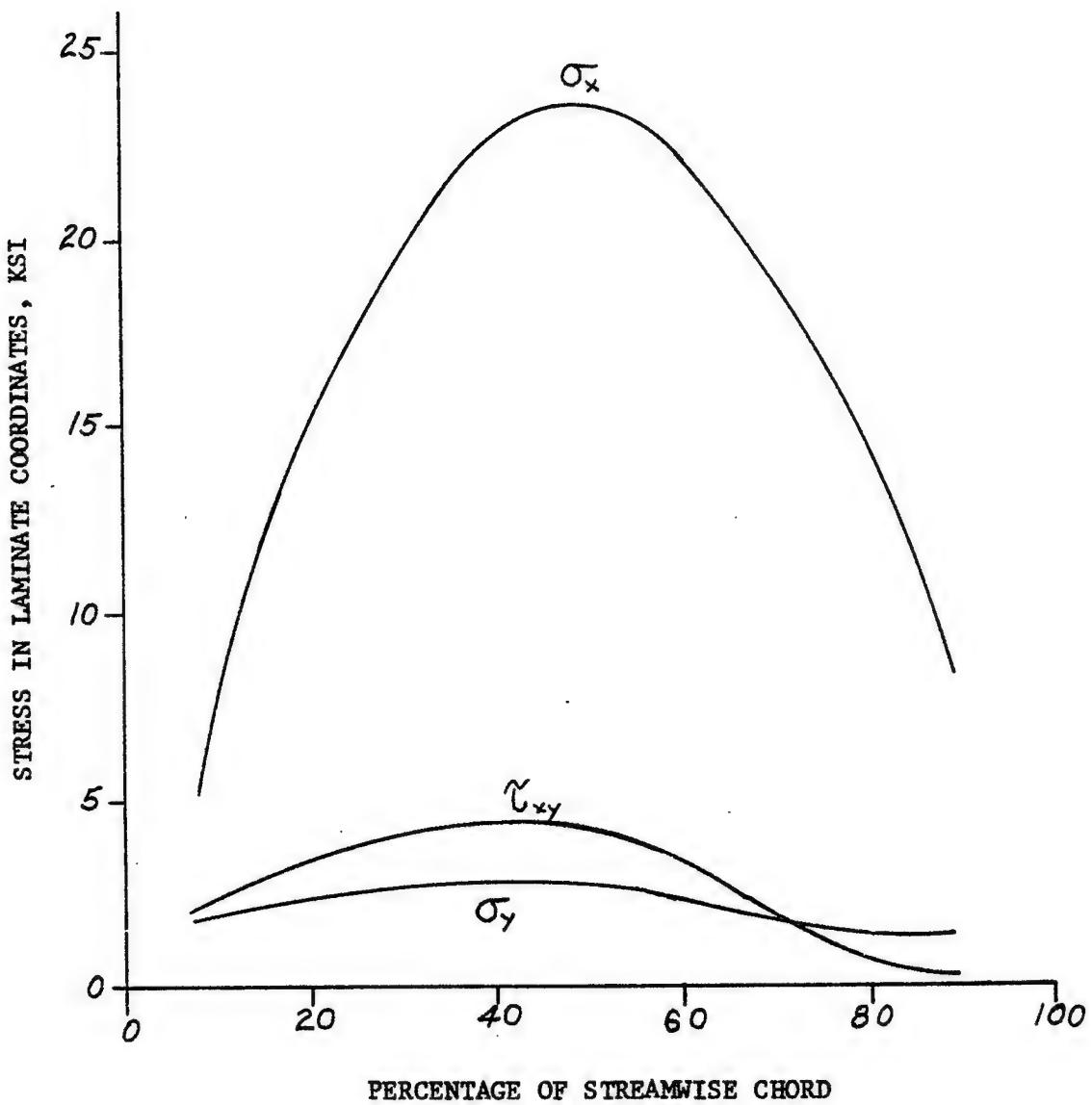


FIGURE 11. LAMINATE STRESSES AT  $Y_w = 24$

FIGURE 12. LAMINATE STRESSES AT  $Y_W = 29$

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**A P P E N D I X   A**  
**NASTRAN BULK DATA DECK**

CART COUNT		SODA-FERN RULK - ANT 4 - F.C.H.O.									
1-	CBAP	1	•	•	2	•	•	3	•	•	4
1-	+AR201	201	•	•	201	•	•	59	•	•	59
2-	CRAR	202	202	202	202	202	202	60	60	60	60
3-	+AR202	203	203	203	203	203	203	61	61	61	61
4-	CRAR	204	204	204	204	204	204	61	61	61	61
5-	+AR203	205	205	205	205	205	205	104	104	104	104
6-	CRAR	206	206	206	206	206	206	61	61	61	61
7-	+AR204	207	207	207	207	207	207	225	225	225	225
8-	CRAR	208	208	208	208	208	208	61	61	61	61
9-	+AR205	209	209	209	209	209	209	61	61	61	61
10-	CRAR	210	210	210	210	210	210	103	103	103	103
11-	+AR211	211	211	211	211	211	211	61	61	61	61
12-	CRAR	212	212	212	212	212	212	61	61	61	61
13-	+AR212	213	213	213	213	213	213	49	49	49	49
14-	CRAR	214	214	214	214	214	214	61	61	61	61
15-	+AR213	215	215	215	215	215	215	13	13	13	13
16-	CRAR	216	216	216	216	216	216	61	61	61	61
17-	+AR214	217	217	217	217	217	217	61	61	61	61
18-	CRAR	218	218	218	218	218	218	61	61	61	61
19-	+AR215	219	219	219	219	219	219	61	61	61	61
20-	CRAR	220	220	220	220	220	220	61	61	61	61
21-	+AR221	221	221	221	221	221	221	34	34	34	34
22-	CRAR	222	222	222	222	222	222	61	61	61	61
23-	+AR222	223	223	223	223	223	223	34	34	34	34
24-	CRAR	224	224	224	224	224	224	61	61	61	61
25-	+AR223	225	225	225	225	225	225	46	46	46	46
26-	CRAR	226	226	226	226	226	226	58	58	58	58
27-	+AR224	227	227	227	227	227	227	61	61	61	61
28-	CRAR	228	228	228	228	228	228	61	61	61	61
29-	+AR231	229	229	229	229	229	229	111	111	111	111
30-	CRAR	230	230	230	230	230	230	61	61	61	61
31-	+AR232	231	231	231	231	231	231	112	112	112	112
32-	CRAR	232	232	232	232	232	232	61	61	61	61
33-	+AR233	233	233	233	233	233	233	58	58	58	58
34-	CRAR	234	234	234	234	234	234	61	61	61	61
35-	+AR234	235	235	235	235	235	235	34	34	34	34
36-	CRAR	236	236	236	236	236	236	61	61	61	61
37-	+AR235	237	237	237	237	237	237	113	113	113	113
38-	CRAR	238	238	238	238	238	238	61	61	61	61
39-	+AR236	239	239	239	239	239	239	114	114	114	114
40-	CRAR	240	240	240	240	240	240	61	61	61	61
41-	+AR241	241	241	241	241	241	241	2	2	2	2
42-	CRAR	242	242	242	242	242	242	2	2	2	2
43-	+AR242	243	243	243	243	243	243	3	3	3	3
44-	CRAR	244	244	244	244	244	244	61	61	61	61
45-	+AR243	245	245	245	245	245	245	5	5	5	5
46-	CRAR	246	246	246	246	246	246	61	61	61	61
47-	+AR244	247	247	247	247	247	247	4	4	4	4
48-	CRAR	248	248	248	248	248	248	61	61	61	61
49-	+AR245	249	249	249	249	249	249	5	5	5	5
50-	CRAR	250	250	250	250	250	250	61	61	61	61

S O R T E D - B U L K - D A T A - E . C . H . N									
CASE	COUNT	1	2	3	4	5	6	7	8
51-	CRAR	246	246	0	0	0	0	0	0
52-	+AP246	0	0	0	0	0	0	0	0
53-	RAPO	247	247	7	0	0	0	0	0
54-	+AP247	0	0	0	0	0	0	0	0
55-	CRAP	248	248	8	9	0	0	0	0
56-	+AP248	0	0	0	0	0	0	0	0
57-	CBAR	249	249	9	10	0	0	0	0
58-	+AP249	0	0	0	0	0	0	0	0
59-	CRAP	253	253	104	72	0	0	1.	1.
60-	+AP253	0	0	225	0	0	0	2.75	2.75
61-	CRAB	254	254	61	106	0	0	0	0
62-	+AP254	0	0	0	0	0	0	0	0
63-	CONM2	1011	13	0	0	2455-3	0	0	0
64-	CONM2	1012	26	0	0	22369-30.0	-2.7	0	0
65-	CONM2	1013	27	0	0	22369-30.0	-1.8	0	0
66-	CONM2	1014	28	0	0	22369-30.0	-7.6	0	0
67-	CONM2	1015	29	0	0	22369-30.0	+5	0	0
68-	CONM2	1016	30	0	0	22369-30.0	1.3	0	0
69-	CONM2	1017	31	0	0	22369-30.0	2.3	0	0
70-	CONM2	1018	44	0	0	22369-30.0	-5	0	0
71-	CONM2	1019	45	0	0	9A204-4-1.2	-7	0	0
72-	CONM2	1021	34	0	0	3108-3.0	0	0	0
73-	CONM2	1022	58	0	0	3108-3.0	0	0	0
74-	RNRD20	1	0	9.0	9.0	76.2469	0.0	9.0	36.2469 1.0
75-	+LAX	53.6	84.030	0.0	0.0	0.0	0.0	0.0	ELAX
76-	CRNPL	151	151	23	11	12	24	0	0
77-	CRNPL	152	152	24	12	13	25	0	0
78-	CRNPL	153	153	35	23	24	35	0	0
79-	CRNPL	154	154	36	24	25	37	0	0
80-	CRNPL	155	155	47	35	36	48	0	0
81-	CRNPL	156	156	48	36	37	49	0	0
82-	CRNPL	157	157	101	47	48	102	0	0
83-	CRNPL	158	158	102	48	49	103	0	0
84-	CRNPL	159	159	59	101	102	60	0	0
85-	CRNPL	160	160	60	102	103	61	0	0
86-	CTPPL	1	1	17	1	2	2	0	0
87-	CTPPL	2	2	2	14	13	0	0	0
88-	CTPPL	3	3	14	2	3	0	0	0
89-	CTPPL	4	4	3	15	14	0	0	0
90-	CTPPL	5	5	15	3	4	0	0	0
91-	CTPPL	6	6	4	16	15	0	0	0
92-	CTPPL	7	7	16	4	5	0	0	0
93-	CTPPL	8	8	5	17	16	0	0	0
94-	CTPPL	9	9	17	5	6	0	0	0
95-	CTPPL	10	10	6	18	17	0	0	0
96-	CTPPL	11	11	18	6	7	0	0	0
97-	CTPPL	12	12	7	19	19	0	0	0
98-	CTPPL	13	13	10	7	8	1	0	0
99-	CTPPL	14	14	8	20	19	0	0	0
100-	CTPPL	15	15	20	8	9	0	0	0

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S O R T E D - B U L K - D A T A - F - C H - 0										
CARD	POINT	1	2	3	4	5	6	7	8	9
101-	CTPPLT	16	16	9	21	20	20	20	20	20
102-	CTRPLT	17	17	21	9	10	10	10	10	10
103-	CTRPLT	18	18	10	22	21	21	21	21	21
104-	CTRPLT	23	23	25	13	14	14	14	14	14
105-	CTRPLT	24	24	14	26	25	25	25	25	25
106-	CTRPLT	25	25	26	14	15	15	15	15	15
107-	CTRPLT	26	26	15	27	26	26	26	26	26
108-	CTRPLT	27	27	27	15	15	15	15	15	15
109-	CTRPLT	28	28	16	28	27	27	27	27	27
110-	CTRPLT	29	29	28	16	16	17	17	17	17
111-	CTRPLT	30	30	17	20	20	20	20	20	20
112-	CTRPLT	31	31	29	17	17	18	18	18	18
113-	CTRPLT	32	32	18	30	29	29	29	29	29
114-	CTRPLT	33	33	30	18	18	18	18	18	18
115-	CTRPLT	34	34	19	31	31	31	31	31	31
116-	CTRPLT	35	35	31	19	19	20	20	20	20
117-	CTRPLT	36	36	20	32	32	31	31	31	31
118-	CTRPLT	37	37	32	20	20	21	21	21	21
119-	CTRPLT	38	38	21	33	33	32	32	32	32
120-	CTPPLT	39	39	33	21	21	22	22	22	22
121-	CTRPLT	40	40	22	34	34	33	33	33	33
122-	CTRPLT	45	45	37	25	25	26	26	26	26
123-	CTRPLT	46	46	26	38	38	37	37	37	37
124-	CTRPLT	47	47	38	26	26	27	27	27	27
125-	CTRPLI	48	48	27	39	39	38	38	38	38
126-	CTRPLT	49	49	39	27	27	28	28	28	28
127-	CTRPLT	50	50	28	40	40	39	39	39	39
128-	CTRPLT	51	51	40	28	28	29	29	29	29
129-	CTRPLT	52	52	29	41	41	40	40	40	40
130-	CTRPLT	53	53	41	29	29	30	30	30	30
131-	CTRPLT	54	54	30	42	42	41	41	41	41
132-	CTRPLT	55	55	42	30	30	31	31	31	31
133-	CTRPLT	56	56	71	43	43	42	42	42	42
134-	CTRPLT	57	57	43	31	31	32	32	32	32
135-	CTRPLT	58	58	32	44	44	43	43	43	43
136-	CTRPLT	59	59	44	32	32	33	33	33	33
137-	CTRPLT	60	60	33	45	45	44	44	44	44
138-	CTRPLT	61	61	45	33	33	34	34	34	34
139-	CTRPLT	62	62	34	46	46	45	45	45	45
140-	CTRPLT	67	67	40	37	37	38	38	38	38
141-	CTRPLY	68	68	78	50	50	49	49	49	49
142-	CTRPLT	69	69	38	105	105	50	50	50	50
143-	CTRPLT	70	70	106	105	105	51	51	51	51
144-	CTRPLT	71	71	51	39	39	40	40	40	40
145-	CTRPLT	72	72	40	52	52	51	51	51	51
146-	CTRPLT	73	73	52	40	40	41	41	41	41
147-	CTRPLT	74	74	41	53	53	52	52	52	52
148-	CTRPLT	75	75	53	41	41	42	42	42	42
149-	CTRPLT	76	76	42	54	54	53	53	53	53
150-	CTRPLT	77	77	54	42	42	43	43	43	43

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## S-O-R-T-E-D--R-U-L-K-D-A-T-A--F-C-H-O

CARD	1	2	3	4	5	6	7	8	9	10
POINT	CTPPLT	78	78	43	55	54	54	54	54	54
151-	CTRPLT	79	79	55	43	44	44	44	44	44
152-	CTEPLT	80	80	44	56	55	55	55	55	55
153-	CTEPLT	81	81	56	44	45	45	45	45	45
154-	CTEPLT	82	82	45	57	57	57	57	57	57
155-	CTEPLT	83	83	57	45	46	46	46	46	46
156-	CTEPLT	84	84	46	58	57	57	57	57	57
157-	CTEPLT	85	85	103	49	50	50	50	50	50
158-	CTEPLT	86	86	50	62	61	61	61	61	61
159-	CTEPLT	87	87	90	50	51	51	51	51	51
160-	CTEPLT	88	88	105	106	50	50	50	50	50
161-	CTEPLT	89	89	107	106	51	51	51	51	51
162-	CTEPLT	90	90	63	51	52	52	52	52	52
163-	CTEPLT	91	91	52	64	63	63	63	63	63
164-	CTEPLT	92	92	53	65	64	64	64	64	64
165-	CTEPLT	93	93	53	53	54	54	54	54	54
166-	CTEPLT	94	94	52	64	63	63	63	63	63
167-	CTEPLT	95	95	64	52	53	53	53	53	53
168-	CTEPLT	96	96	53	65	64	64	64	64	64
169-	CTEPLT	97	97	65	53	54	54	54	54	54
170-	CTEPLT	98	98	54	66	65	65	65	65	65
171-	CTEPLT	99	99	66	54	55	55	55	55	55
172-	CTEPLT	100	100	55	67	66	66	66	66	66
173-	CTEPLT	101	101	67	55	56	56	56	56	56
174-	CTEPLT	102	102	56	64	67	67	67	67	67
175-	CTEPLT	103	103	68	56	57	57	57	57	57
176-	CTEPLT	104	104	57	69	68	68	68	68	68
177-	CTEPLT	105	105	69	57	58	58	58	58	58
178-	CTEPLT	106	106	58	70	59	59	59	59	59
179-	CTEPLT	107	107	104	61	62	62	62	62	62
180-	CTEPLT	108	108	108	62	72	71	71	71	71
181-	CTEPLT	109	109	107	72	52	52	52	52	52
182-	CTEPLT	110	110	63	73	72	72	72	72	72
183-	CTEPLT	111	111	73	63	64	64	64	64	64
184-	CTEPLT	112	112	64	74	73	73	73	73	73
185-	CTEPLT	113	113	74	64	65	65	65	65	65
186-	CTEPLT	114	114	65	75	74	74	74	74	74
187-	CTEPLT	115	115	75	65	66	66	66	66	66
188-	CTEPLT	116	116	66	76	75	75	75	75	75
189-	CTEPLT	117	117	76	66	67	67	67	67	67
190-	CTEPLT	118	118	67	77	76	76	76	76	76
191-	CTEPLT	119	119	77	67	68	68	68	68	68
192-	CTEPLT	120	120	68	78	77	77	77	77	77
193-	CTEPLT	121	121	78	68	69	69	69	69	69
194-	CTEPLT	122	122	69	79	78	78	78	78	78
195-	CTEPLT	123	123	79	69	70	70	70	70	70
196-	CTEPLT	124	124	70	80	79	79	79	79	79
197-	CTEPLT	125	125	81	71	72	72	72	72	72
198-	CTEPLT	126	126	72	82	81	81	81	81	81
199-	CTEPLT	127	127	82	72	73	73	73	73	73
200-	CTEPLT	128	128	72	83	82	82	82	82	82

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## S-O-R T-E-D-B-U-L-K-N-A-T-A-F-C-H-N

CARD	1	2	3	4	5	6	7	8	9	10
COUNT	CTRPLT	132	132	75	85	84	0.0	0.0	0.0	0.0
201-	CTRPLT	133	133	85	75	76	0.0	0.0	0.0	0.0
202-	RTRPLT	134	134	76	96	85	0.0	0.0	0.0	0.0
203-	CTRPLT	135	135	86	76	77	0.0	0.0	0.0	0.0
204-	CTRPLT	136	136	77	87	86	0.0	0.0	0.0	0.0
205-	CTRPLT	137	137	87	77	78	0.0	0.0	0.0	0.0
206-	CTRPLT	138	138	78	88	87	0.0	0.0	0.0	0.0
207-	CTRPLT	139	139	88	78	79	0.0	0.0	0.0	0.0
208-	CTRPLT	140	140	79	89	88	0.0	0.0	0.0	0.0
209-	CTRPLT	141	141	99	79	80	0.0	0.0	0.0	0.0
210-	CTRPLT	600	600	105	38	39	12.448			
211-	CTRPLT	700	700	36	51	105	0.0	0.0	0.0	0.0
212-	CTRPLT	890	890	61	107	50	0.0	0.0	0.0	0.0
213-	RTRPLT	900	900	62	50	106	0.0	0.0	0.0	0.0
214-	CTRPLT	910	910	106	107	62	0.0	0.0	0.0	0.0
215-	CTRPLT	920	920	51	63	107	0.0	0.0	0.0	0.0
216-	CTRPLT	1070	1070	71	104	62	0.0	0.0	0.0	0.0
217-	CTRPLT	1090	1090	72	107	63	-14.990			
218-	EIGR	4	GTV	0.0	225.	8	0.0	0.0	0.0	0.0
219-	+ONES4	MAX								
220-	CONST	1				1	126			
221-	GRIN	1								
222-	GRIN	2								
223-	GRIN	3								
224-	GRIN	4								
225-	GRIN	5								
226-	GRIN	6								
227-	GRIN	7								
228-	GRIN	8								
229-	GRIN	9								
230-	GRIN	10								
231-	GRIN	11								
232-	GRIN	12								
233-	GRIN	13								
234-	GRIN	14								
235-	GRIN	15								
236-	GRIN	16								
237-	GRIN	17								
238-	GRIN	18								
239-	GRIN	19								
240-	GRIN	20								
241-	GRIN	21								
242-	GRIN	22								
243-	GRIN	23								
244-	GRIN	24								
245-	GRIN	25								
246-	GRIN	26								
247-	GRIN	27								
248-	GRIN	28								
249-	GRIN	29								

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17.1790-17.10890-0-  
-8.9523-15.97250.0  
-0.7257-14.83610.0  
7.5098-13.69960.0  
23.9542-11.42640.0  
32.1809-10.29040.0  
40.4075-0.15400.0  
48.6361-0.11760.0  
56.2026-6.97210.0  
-18.2241-5.44780.0 0 0 126  
-15.0446-8.63630.0 0 0 126  
-11.8732-11.82470.0 0 0 126  
-4.0391-11.07070.0  
3.7049-10.33390.0  
-11.6289-9.58850.0  
19.4630-8.84310.0  
27.2970-8.09770.0  
35.1310-7.35230.0  
42.9650-6.50600.0  
-5.9638-5.93050.0  
1.4330-5.62950.0  
8.8207-5.41960.0  
16.2255-5.10970.0  
37.6273-4.69900.0

## C O R T E D . R U L K - D A T A - F C H a

CARD	POINT	1	2	3	4	5	6	7	8	9	10
251-	GRIN	.50			-31.0200	-4.3898	0.0				
252-	GPIN	31			38.4168	-4.0799	0.0				
253-	GRIN	32			45.8135	-3.7700	0.0				
254-	GRIN	33			53.2103	-3.4601	0.0				
255-	GPID	34			60.0153	-3.1740	0.0				
256-	GPIN	35			-6.4479	6.2804	0.0	0	0	126	
257-	GRID	36			-3.2725	7.0319	0.0	0	0	126	
258-	GRIN	37			-9.0970	-0.0666	0.0	0	0	126	
259-	GPID	38			6.8656	-0.2190	0.0				
260-	GRIN	39			13.8283	-0.3414	0.0				
261-	GPIN	40			20.7909	-0.4630	0.0				
262-	GRIN	41			27.7536	-0.5863	0.0				
263-	GPID	42			34.7162	-0.7097	0.0				
264-	GPIN	43			41.6789	-0.8311	0.0				
265-	GPID	44			48.5415	-0.9536	0.0				
266-	GPID	45			55.6042	-1.0760	0.0				
267-	GPID	46			62.0008	-1.1846	0.0				
268-	GPIN	47			-0.5813	12.1230	0.0	0	0	126	
269-	GPID	48			2.0942	-8.9348	0.0	0	0	126	
270-	GRIN	49			5.7696	5.7451	0.0	0	0	126	
271-	GPIN	50	0	12.0	49.7	0.0					
272-	GPIN	51			18.8267	-4.6366	0.0				
273-	GPID	52			25.3553	4.0818	0.0				
274-	GPIN	53			31.9838	3.5271	0.0				
275-	GPIN	54			38.4123	2.9723	0.0				
276-	GPID	55			44.9409	2.4176	0.0				
277-	GPIN	56			51.4694	1.8626	0.0				
278-	GRIN	57			57.9979	1.3080	0.0				
279-	GPID	58			64.0042	0.7977	0.0				
280-	GRIN	59			4.3150	16.4993	0.0	0	0	126	
281-	GRID	60			7.4904	13.8109	0.0	0	0	126	
282-	GPIN	61			10.6650	10.6224	0.0	0	0	126	
283-	GRIN	62	0	12.0	53.5	0.0					
284-	GRIN	63			22.9964	8.7912	0.0				
285-	GRIN	64			29.1666	7.8756	0.0				
286-	GPID	65			35.3398	6.0601	0.0				
287-	GRID	66			41.4971	6.0445	0.0				
288-	GPID	67			47.5633	5.1289	0.0				
289-	GRIN	68			53.8295	4.2133	0.0				
290-	GRID	69			59.9958	3.2977	0.0				
291-	GRIN	70			65.5687	2.4554	0.0				
292-	GPID	71	0	11.25	50.5	0.0					
293-	GPID	72			21.5808	14.4361	0.0				
294-	GPIN	73			27.3676	13.1426	0.0				
295-	GRIN	74			33.1543	11.8491	0.0				
296-	GRIN	75			38.9411	10.5556	0.0				
297-	GRIN	76			44.7279	9.2621	0.0				
298-	GPIN	77			50.5147	7.0686	0.0				
299-	GRID	78			56.3014	6.6751	0.0				

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## FINAL VIBRATION MODES ANALYSIS

JUNF 20, 1973 NASTDAN 6/15/72 DNGF

## S-O-R-T-E D-A-U-L-K-D-A-T-A-F-C-H-O

CARD	POINT	1	2	3	4	5	6	7	8	9	10
301-	GPI1	0	0	53.6	AB.0496	0					
302-	GRIN	81	0	11.25	71.2321	0					
303-	GPI1	82		29.2236	22.0477	0					
304-	GPI1	83		34.3997	20.1460	0					
305-	GPI1	84		79.5757	10.2443	0					
306-	GRIN	85		44.7519	16.7425	0					
307-	GPI1	86		49.9278	14.4408	0					
308-	GPI1	87		55.1039	12.5391	0					
309-	GRIN	88		60.2799	10.6777	0					
310-	GPI1	89	0	50.8735	89.6461	0					
311-	GPI1	101	0	0.0	49.7	0					
312-	GPI1	102	0	4.6	49.7	0					
313-	GPI1	103	0	9.0	49.3	0					
314-	GRIN	104	0	9.0	54.3	0					
315-	GPI10	105	0	15.5	47.75	0					
316-	GPI10	106		15.5	52.0	0					
317-	GPI1	107	0	15.5	56.15	0					
318-	GPI1	111	0	53.6	90.55	0					
319-	GPI10	112	0	53.6	86.05	0					
320-	GPI10	113	0	53.6	72.05	0					
321-	GRIN	114	0	53.6	67.55	0					
322-	WAT1	2	3.0+4	7.0+4							
323-	WAT1										
324-	WAT1	10	16.0+6	6.2+6							
325-	WAT1	11	10.5+6	3.3							
326-	WAT1	12	2.5+6	5.166+6							
327-	WAT1	13	2.6+6	1.3+6							
328-	WAT1	15	5.0+6	2.0+6							
329-	MAT12	1	9.2875+6.1	49.15+6.1-1.571+6.9	2875+6-1.571+6.2	19.05+6					
330-	MAT2	3	8.9892+6.2	19.02+6-1.8A6+6.8	9A82+6-1.8A6+6.2	4.992+6					
331-	MAT2	4	2.344+6.1	29.6 A.0	1.74	7+7 0.0					
332-	MAT2	6	9.5272+6.1	65.12+6-0.427+6.9	52.72+6-0.427+6.1	59.92+6					
333-	MAT2	7	3.177+6.2	64.01+5-2.446+5.1	39.0	3+7-3.4	2+5.2	9.491+6			
334-	NMTT1	3	15	17	19	21	-26	26	30		
335-	+NPOP7	32	39	41	43	45	52	54	56		
336-	+DROP71	63	F5	F7	69	72	74	76	78		
337-	+DNP72	103	105								
338-	NMTT1	4	11	23	35	47	59	101			
339-	NMTT1	45	1	THRU	10						
340-	NMTT1	45	12	THRU	22						
341-	CMIT1	45	24	THRU	74						
342-	CMIT1	45	36	THRU	45						
343-	DMIT1	45	48	THRU	58						
344-	DMIT1	45	67	THRU	89						
345-	DMIT1	45	102	THRU	107						
346-	CMIT1	45	111	THRU	116						
347-	DAR4	37									
348-	RNG	201	12	130R	1.3131	1.	.607	.4	0.0		
349-	+RNG201	0.68		0.68	0.	.67	0.	.67			
350-	+RNG201A	0.4198	1.	0.	0.	0.	0.	0.	0.		

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## S-O-R-T-E-D-B-U-L-K-G-A-T-A-F-C-H-A

POINT	1	••	?	••	3	••	4	••	5	••	6	••	7	••	8	••	9	••	10
351-	PBAR	202	-	12	-	1304	-	11671	-	1	-	6955	-	400	-	PRAR202	-	-	
352-	+RAR202	.67	0.	-	.67	0.	-	.67	0.	-	.67	0.	-	.67	0.	PRAR202A	-	-	
353-	+3AP202A	.4110	1.	-	1708	-	1.3131	-	1.	-	69764	-	00	-	-	PRAR203	-	-	
354-	PNAO	20*	-	12	-	.67	0.	.68	0.	-	.68	0.	-	.68	0.	PRAR203A	-	-	
355-	+RAR203	.67	0.	-	1708	-	1.3131	-	1.	-	69764	-	00	-	-	PRAR204	-	-	
356-	+RA0203A	.4128	1.	-	0.	-	1324	-	0.	-	70614	-	00	-	-	PRAR204	-	-	
357-	PBAR	204	-	12	-	1324	-	0.	-	70614	-	00	-	-	PRAR204A	-	-		
358-	+RAR204	.70	0.	-	.70	0.	-	.63	0.	-	.63	0.	-	.63	0.	PRAR204A	-	-	
359-	+BAR204A	.4199	1.	-	0.	-	1316	-	1.0587	-	1.	-	70194	-	00	-	-	PRAR205	-
360-	PBAR	205	-	12	-	1316	-	1.0587	-	1.	-	70194	-	00	-	-	PRAR205A	-	
361-	+RAR205	.69	0.	-	.69	0.	-	.69	0.	-	.69	0.	-	.68	0.	PRAR205A	-	-	
362-	+RA0205A	.4164	1.	-	0.	-	2910	-	1.2357	-	1.	-	70123	-	00	-	-	PRAR211	-
363-	PBAR	211	-	12	-	.67	0.	.67	0.	-	.67	0.	-	.67	0.	PRAR211A	-	-	
364-	+RAR211	.67	0.	-	.67	0.	-	.67	0.	-	.67	0.	-	.67	0.	PRAR211A	-	-	
365-	+BAP211A	.2302	1.	-	0.	-	29025	-	29059	-	1.	-	69873	-	00	-	-	PRAR212	-
366-	PBAR	212	-	12	-	29025	-	29059	-	1.	-	69873	-	00	-	-	PRAR212A	-	
367-	+RAR212	.67	0.	-	.67	0.	-	.67	0.	-	.655	0.	-	.655	0.	PRAR212A	-	-	
368-	+BAP212A	.22825	1.	-	0.	-	28955	-	29607	-	1.	-	69623	-	00	-	-	PRAR213	-
369-	PBAR	213	-	12	-	28955	-	29607	-	1.	-	69623	-	00	-	-	PRAR213A	-	
370-	+RAR213	.655	0.	-	.655	0.	-	.655	0.	-	.655	0.	-	.655	0.	PRAR213A	-	-	
371-	+RAR213A	.22625	1.	-	0.	-	22145	-	26377	-	1.	-	31843	-	00	-	-	PRAR214	-
372-	PBAR	214	-	12	-	22145	-	26377	-	1.	-	31843	-	00	-	-	PRAR214A	-	
373-	+RA0214	.655	0.	-	.655	0.	-	.655	0.	-	.655	0.	-	.655	0.	PRAR214A	-	-	
374-	+RA0214A	.2412	1.	-	0.	-	22245	-	25345	-	1.	-	32053	-	00	-	-	PRAR215	-
375-	PBAR	215	-	12	-	22245	-	25345	-	1.	-	32053	-	00	-	-	PRAR215A	-	
376-	+RA0215	.68	0.	-	.68	0.	-	.68	0.	-	.68	0.	-	.68	0.	PRAR215A	-	-	
377-	+BAP215A	.2446	1.	-	0.	-	65625	-	769-2	-	1.	-	02661	-	00	-	-	PRAD221	-
378-	PBAR	221	-	13	-	65625	-	769-2	-	1.	-	02661	-	00	-	-	PRAR221A	-	
379-	+RA0221	.1875	0.	-	.1875	0.	-	.1875	0.	-	.1875	0.	-	.1875	0.	PRAR221A	-	-	
380-	+RA0221A	.657	1.	-	.667	1.	-	.667	1.	-	.667	1.	-	.667	1.	PRAR231	-	-	
381-	PBAR	231	-	11	-	52174	-	03225	-	1.	-	1.	-	00	-	-	PRAR231A	-	
382-	+BAP231	0.	0.	-	0.	-	0.	-	0.	-	0.	-	0.	-	0.	PRAR241	-	-	
383-	+RA0231A	.5	5.	-	0.	-	27125	-	0021722	-	017306	-	019678	-	00	-	-	PRAR241A	-
384-	PBAR	241	-	15	-	27125	-	0021722	-	017306	-	019678	-	00	-	-	PRAR242	-	
385-	+RA0241	0.	0.	-	0.	-	0.	-	0.	-	0.	-	0.	-	0.	PRAR242A	-	-	
386-	+RAR241A	.87	.87	-	.83	-	0.	-	0.	-	0.	-	0.	-	0.	PRAR243	-	-	
387-	PBAR	242	-	15	-	265125	-	00217284	-	0169155	-	01894390	-	00	-	-	PRAR243A	-	
388-	+RAR242	0.	0.	-	0.	-	0.	-	0.	-	0.	-	0.	-	0.	PRAR242A	-	-	
389-	+PAR242A	.83	.83	-	.83	-	0.	-	0.	-	0.	-	0.	-	0.	PRAR244	-	-	
390-	PBAR	243	-	15	-	296	-	0021611	-	02466	-	02622770	-	00	-	-	PRAR244A	-	
391-	+BA0243	0.	0.	-	0.	-	0.	-	0.	-	0.	-	0.	-	0.	PRAD245	-	-	
392-	+RA0243A	.83	.83	-	.83	-	0.	-	0.	-	0.	-	0.	-	0.	PRAD245A	-	-	
393-	PBAR	244	-	15	-	.289	-	.0020114	-	.024083	-	.02609480	-	00	-	-	PRAR246	-	
394-	+RA0244	0.	0.	-	0.	-	0.	-	0.	-	0.	-	0.	-	0.	PRAR246A	-	-	
395-	+BAP244A	.83	.83	-	.83	-	0.	-	0.	-	0.	-	0.	-	0.	PRAD247	-	-	
396-	PBAR	245	-	15	-	2A2	-	.0018688	-	.0235	-	.02536880	-	00	-	-	PRAD245A	-	
397-	+BA0245	0.	0.	-	0.	-	0.	-	0.	-	0.	-	0.	-	0.	PRAR246	-	-	
398-	+RA0245A	.83	.83	-	.83	-	0.	-	0.	-	0.	-	0.	-	0.	PRAR246A	-	-	
399-	PBAR	246	-	15	-	.275	-	.0017330	-	.022916	-	.024649	-	00	-	-	PRAR246A	-	
400-	+RA0246	0.	0.	-	0.	-	0.	-	0.	-	0.	-	0.	-	0.	PRAD247	-	-	

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## FINAL VIBRATION MODES ANALYSIS

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CARD	S-0-P-7-E-9-B-U-L-K-D-A-T-A-F-C-H-9
401-	1 . . . 2 . . . 3 . . . 4 . . . 5 . . . 6 . . . 7 . . . 8 . . . 9 . . . 10 .
402-	+PBAR246A . 83 . 83 . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
403-	PBAR 247 15 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
404-	+PBAR247A . 83 . 83 . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
405-	PBAR 248 15 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
406-	+PBAR248 . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
407-	+PBAR248A . 83 . 83 . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
408-	PBAR 249 15 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
409-	+PBAR249 . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
410-	+PBAR249A . 83 . 83 . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
411-	PBAR 253 12 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
412-	+PBAR253 . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
413-	+PBAR253A . 83 . 83 . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
414-	PBAR 254 12 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
415-	+PBAR254 . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
416-	+PBAR254A . 83 . 83 . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
417-	PBNLT 151 4 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
418-	PBNLT 152 4 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
419-	PBNPLT 153 4 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
420-	PBNPLT 154 4 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
421-	PQDPLT 155 4 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
422-	PQDPLT 156 4 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
423-	PQDPLT 157 4 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
424-	PQDPLT 158 4 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
425-	PQDPLT 159 10 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
426-	PQDPLT 160 10 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
427-	PTDPLT 1 7 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
428-	PTDPLT 2 7 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
429-	PTDPLT 3 7 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
430-	PTDPLT 4 7 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
431-	PTDPLT 5 1 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
432-	PTDPLT 6 1 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
433-	PTDPLT 7 1 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
434-	PTDPLT 8 1 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
435-	PTDPLT 9 1 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
436-	PTDPLT 10 1 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
437-	PTDPLT 11 1 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
438-	PTDPLT 12 1 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
439-	PTDPLT 13 6 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
440-	PTDPLT 14 6 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
441-	PTDPLT 15 6 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
442-	PTDPLT 16 6 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
443-	PTDPLT 17 6 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
444-	PTDPLT 18 6 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
445-	PTDPLT 23 7 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
446-	PTDPLT 24 7 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
447-	PTDPLT 25 7 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
448-	PTDPLT 26 7 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .
449-	PTDPLT 27 3 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 . . . 0 .

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S-O-R-T E-N-B U L-K-D A-T A-E.G.H-O										
CARD	1	2	3	4	5	6	7	8	9	10
451- COUNT	.PTPLT	.29	.03	.03	.04	.104	.337	.52	.52	.52
452- PTPLT	.70	.7	.043	.2	.110	.324	.55	.55	.55	.55
453- PTPLT	.31	.3	.030	.2	.92	.296	.46	.46	.46	.46
454- PTPLT	.32	.3	.028	.2	.98	.267	.49	.49	.49	.49
455- PTPLT	.73	.3	.020	.2	.82	.256	.41	.41	.41	.41
456- PTPLT	.34	.3	.021	.2	.870	.258	.44	.44	.44	.44
457- PTPLT	.35	.1	.008	.2	.72	.185	.36	.36	.36	.36
458- PTPLT	.36	.1	.010	.2	.76	.187	.38	.38	.38	.38
459- PTPLT	.37	.1	.014	.2	.62	.179	.31	.31	.31	.31
460- PTPLT	.38	.1	.007	.2	.66	.181	.33	.33	.33	.33
461- PTPLT	.39	.1	.004	.2	.52	.171	.26	.26	.26	.26
462- PTPLT	.40	.1	.005	.2	.54	.173	.27	.27	.27	.27
463- PTPLT	.45	.7	.137	.2	.212	.529	.79	.79	.79	.79
464- PTPLT	.46	.7	.160	.2	.21	.528	.78	.78	.78	.78
465- PTPLT	.47	.7	.135	.2	.20	.494	.74	.74	.74	.74
466- PTPLT	.48	.7	.143	.2	.20	.494	.74	.74	.74	.74
467- PTPLT	.49	.3	.097	.2	.202	.422	.70	.70	.70	.70
468- PTPLT	.50	.3	.096	.2	.202	.422	.70	.70	.70	.70
469- PTPLT	.51	.3	.066	.2	.21	.355	.63	.63	.63	.63
470- PTPLT	.52	.3	.058	.2	.125	.355	.63	.63	.63	.63
471- PTPLT	.53	.3	.064	.2	.114	.294	.57	.57	.57	.57
472- PTPLT	.54	.3	.032	.2	.112	.277	.56	.56	.56	.56
473- PTPLT	.55	.3	.028	.2	.102	.254	.51	.51	.51	.51
474- PTPLT	.56	.3	.027	.2	.100	.252	.50	.50	.50	.50
475- PTPLT	.57	.1	.013	.2	.890	.197	.45	.45	.45	.45
476- PTPLT	.58	.1	.010	.2	.88	.195	.46	.46	.46	.46
477- PTPLT	.59	.1	.010	.2	.76	.187	.38	.38	.38	.38
478- PTPLT	.60	.1	.009	.2	.74	.188	.37	.37	.37	.37
479- PTPLT	.61	.1	.007	.2	.64	.179	.32	.32	.32	.32
480- PTPLT	.62	.1	.006	.2	.62	.179	.31	.31	.31	.31
481- PTPLT	.67	.7	.174	.2	.231	.811	.889	.889	.889	.889
482- PTPLT	.68	.7	.167	.2	.27	.688	.80	.80	.80	.80
483- PTPLT	.69	.7	.154	.2	.23	.658	.79	.79	.79	.79
484- PTPLT	.70	.3	.132	.2	.212	.545	.73	.73	.73	.73
485- PTPLT	.71	.3	.101	.2	.199	.488	.71	.71	.71	.71
486- PTPLT	.72	.3	.088	.2	.104	.509	.67	.67	.67	.67
487- PTPLT	.73	.3	.069	.2	.129	.354	.65	.65	.65	.65
488- PTPLT	.74	.3	.053	.2	.121	.331	.60	.60	.60	.60
489- PTPLT	.75	.3	.040	.2	.126	.296	.58	.58	.58	.58
490- PTPLT	.76	.3	.031	.2	.103	.274	.54	.54	.54	.54
491- PTPLT	.77	.3	.020	.2	.104	.271	.52	.52	.52	.52
492- PTPLT	.78	.1	.020	.2	.96	.261	.48	.48	.48	.48
493- PTPLT	.79	.1	.010	.2	.92	.198	.46	.46	.46	.46
494- PTPLT	.80	.1	.010	.2	.84	.163	.42	.42	.42	.42
495- PTPLT	.81	.1	.008	.2	.78	.189	.39	.39	.39	.39
496- PTPLT	.82	.1	.008	.2	.72	.185	.36	.36	.36	.36
497- PTPLT	.83	.1	.007	.2	.66	.181	.33	.33	.33	.33
498- PTPLT	.84	.1	.006	.2	.60	.177	.30	.30	.30	.30
499- PTPLT	.85	.1	.007	.2	.331	.128	.21	.21	.21	.21
500- PTPLT	.86	.10	.057	.2	.331	.128	.21	.21	.21	.21

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## S-O-R-T-E-D B U T-C R D A-F C H A N

CARD	R CINT	1	2	3	4	5	6	7	8	9	10
501-	PTRPLT	.01	.03	.154	.02	.227	.581-4	.78	.72		
502-	PTDPLT	.92	.7	.118	.2	.01	.511-4	.69	.69		
503-	PTemLT	.63	.3	.072	.2	.177	.711-4	.61	.61		
504-	PTaplT	.34	.3	.042	.2	.157	.745-4	.54	.54		
505-	PTaplT	.95	.3	.044	.2	.110	.309-4	.55	.55		
506-	PTaplT	.96	.3	.029	.2	.040	.294-4	.69	.49		
507-	PTaplT	.97	.3	.027	.2	.1.0	.269-4	.50	.50		
508-	PTDPLT	.98	.1	.020	.2	.08	.244-4	.44	.44		
509-	PTDPLT	.99	.1	.020	.2	.08	.244-4	.44	.44		
510-	PTDPLT	.100	.1	.010	.2	.079	.705-4	.39	.39		
511-	PTDPLT	.101	.1	.010	.2	.078	.189-4	.39	.79		
512-	PTDPLT	.102	.1	.008	.2	.068	.182-4	.34	.34		
513-	PTPRLT	.103	.1	.007	.2	.066	.111-4	.33	.33		
514-	PTDPLT	.104	.1	.005	.2	.058	.175-4	.29	.29		
515-	PTDPLT	.105	.1	.005	.2	.056	.174-4	.28	.28		
516-	PTPRLT	.106	.1	.004	.2	.048	.468-4	.24	.24		
517-	PTDPLT	.107	.10	.169	.2	.3.81	.12A-3	.81	.81		
518-	PTDPLT	.108	.3	.089	.2	.1.73	.288-4	.61	.61		
519-	PTDPLT	.109	.3	.099	.2	.1.87	.379-4	.64	.64		
520-	PTDPLT	.110	.1	.022	.2	.1.16	.293-4	.43	.43		
521-	PTDPLT	.111	.1	.027	.2	.1.28	.279-4	.44	.44		
522-	PTDPLT	.112	.1	.014	.2	.1.07	.218-4	.37	.37		
523-	PTDPLT	.113	.1	.015	.2	.040	.235-4	.40	.40		
524-	PTDPLT	.114	.1	.010	.2	.060	.167-4	.33	.33		
525-	PTPRLT	.115	.1	.010	.2	.072	.2m1-4	.36	.36		
526-	PTDPLT	.116	.1	.007	.2	.060	.193-4	.39	.39		
527-	PTDPLT	.117	.1	.008	.2	.064	.166-4	.32	.32		
528-	PTPRLT	.118	.1	.005	.2	.030	.171-4	.26	.26		
529-	PTDPLT	.119	.1	.005	.2	.056	.174-4	.28	.28		
530-	PTDPLT	.120	.6	.003	.2	.046	.167-4	.23	.23		
531-	PTPRLT	.121	.6	.003	.2	.048	.182-4	.24	.24		
532-	PTDPLT	.122	.6	.002	.2	.040	.147-4	.20	.20		
533-	PTDPLT	.123	.6	.002	.2	.040	.147-4	.20	.20		
534-	PTDPLT	.124	.6	.12676-72		.3867013854-8	.15285				
535-	PTDPLT	.125	.1	.005	.2	.784	.1A6-4	.78	.78		
536-	PTDPLT	.126	.6	.001	.2	.448	.1L8-4	.16	.16		
537-	PTDPLT	.127	.6	.004	.2	.728	.166-4	.26	.26		
538-	PTDPLT	.128	.6	.001	.2	.335	.14n-4	.17	.17		
539-	PTDPLT	.129	.6	.002	.2	.532	.157-4	.21	.21		
540-	PTDPLT	.130	.6	.001	.2	.3m8	.138-4	.11	.11		
541-	PTDPLT	.131	.6	.002	.2	.38	.145-4	.19	.19		
542-	PTDPLT	.132	.6	.004	.2	.20	.173-4	.08	.08		
543-	PTDPLT	.133	.6	.001	.2	.34	.139-4	.14	.14		
544-	PTDPLT	.134	.6	.0003	.2	.1n	.132-4	.09	.09		
545-	PTDPLT	.135	.6	.001	.2	.30	.140-4	.15	.15		
546-	PTDPLT	.136	.6	.003	.2	.16	.131-4	.08	.08		
547-	PTDPLT	.137	.6	.001	.2	.28	.139-4	.14	.14		
548-	PTDPLT	.138	.6	.0002	.2	.14	.129-4	.07	.07		
549-	PTDPLT	.139	.6	.001	.2	.24	.136-4	.12	.12		

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## C-O-R-T E N - R U L K - D A T A - E C H O -

CARD	1	2	3	4	5	6	7	8	9	10
551-	PTROLT	141	6	5365.9	.82	1874526854	-8	.093925	-	.093925
552-	PTROLT	690	7	.147	2	2.22	.465	.4	.75	.75
553-	PTROLT	700	3	.128	2	2.09	.518	.4	.73	.73
554-	PTROLT	890	40	.157	2	7.31	.128	.3	.81	.81
555-	PTROLT	900	3	.159	2	2.31	.583	.4	.79	.79
556-	PTROLT	910	3	.126	2	7.53	.015	.4	.74	.74
557-	PTROLT	920	3	.085	2	1.74	.418	.4	.62	.62
558-	PTROLT	1070	3	.089	2	2.14	.366	.4	.73	.73
559-	PTROLT	1190	3	.056	2	1.57	.329	.4	.54	.54
560-	SE0GD	101	58.5	.102	58.6	10.3	58.8	.104	70.5	70.5
561-	SE0GD	105	46.5	.106	50.5	10.7	52.5			
562-	SE0GD	111	34.2	.112	34.4	11.3	58.3	11.4	58.4	58.4
563-	SPC1	2	5	.11	23	35	.47	.59	1n1	1n1

ENDATA

\*\*NO ERRORS FOUND - EXECUTF NASTRAN PROGRAM\*\*

METHOD 2,NR,NBR,PASSES = 1,EST,TIME = .7  
METHOD 1,T,NBR,PASSES = 1,EST,TIME = .2

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A P P E N D I X   B  
NASTRAN STATIC ANALYSIS OUTPUT DATA

NADC-73235-30

DISPLACEMENT VECTOR									
POINT ID.	NAME	TYPE	T1	T2	T3	R1	R2	R3	
1	G	0.0	3.0	1.1623136-J-2	-8.555311E-J-3	-2.718893E-J-3	6.0		
2	G	0.0	3.0	2.222504E-J-2	-4.006520868E-J-3	-1.993J69E-J-3	6.0		
3	G	0.0	3.0	5.90dJ45L-J-2	-2.0J5+25E-J-3	-8.4J7231E-J-3	6.0		
4	G	0.0	3.0	4.81776J-E-J-1	-6.031098E-J-3	-2.134511E-J-2	0.0		
5	G	0.0	3.0	4.227638E-J-1	9.401448E-J-4	-4.621654E-J-2	0.0		
6	G	0.0	3.0	9.722853E-J-1	-6.241153E-J-4	-6.878565E-J-2	0.0		
7	G	0.0	3.0	1.570551E+J-0	-1.039974E-L-J-2	-1.039562E-J-1	0.0		
8	G	0.0	3.0	2.527253E+J-0	-1.542975E-J-2	-1.39513E-J-1	0.0		
9	G	0.0	3.0	3.775534E+J-0	-6.614939E-J-2	-1.733J48E-J-1	0.0		
10	G	0.0	3.0	6.128252L+J-0	-3.622777E-J-2	-1.925823E-J-1	0.0		
11	G	0.0	3.0	1.279254E-J-2	-2.989087E-J-4	0.0	0.0		
12	G	0.0	3.0	9.331523E-J-3	-3.272300E-J-4	-2.4450J4E-J-5	0.0		
13	G	0.0	3.0	0.0	4.054744E-J-3	-2.3916328E-J-3	6.0		
14	G	0.0	3.0	2.613576E-J-2	-1.621916E-J-3	-5.667439E-J-3	0.0		
15	G	0.0	3.0	1.628103E-J-1	-1.145939E-J-3	-4.476202E-J-2	0.0		
16	G	0.0	3.0	2.23d155E-J-1	-2.257595E-J-3	-2.943510E-J-2	0.0		
17	G	0.0	3.0	5.896596E-J-1	-4.269741E-J-3	-1.68733E-J-2	0.0		
18	G	0.0	3.0	1.417244E+J-0	-9.239354E-J-3	-7.941433E-J-2	0.0		
19	G	0.0	3.0	1.850525E+J-0	-1.619056E-J-2	-1.083212E-J-1	0.0		
20	G	0.0	3.0	2.830254E+J-0	-2.539169E-J-2	-1.457123E-J-1	0.0		
21	G	0.0	3.0	4.036887E+J-0	-3.594340E-J-2	-1.750760E-J-1	0.0		
22	G	0.0	3.0	5.430635E+J-0	-4.569068E-62	-1.933751E-J-1	0.0		
23	G	0.0	3.0	2.757547E-J-2	-1.6338856E-J-3	0.0	0.0		
24	G	0.0	3.0	2.027937E-J-2	-1.034574E-J-3	-3.104885E-J-3	0.0		
25	G	0.0	3.0	3.6	0.549093E-J-4	-2.573861E-J-3	0.0		
26	G	0.0	3.0	5.438202E-J-2	-4.950562E-J-3	-2.262268E-J-2	0.0		
27	G	0.0	3.0	1.751514E-J-1	-5.334769E-J-3	-3.989163E-J-2	0.0		
28	G	0.0	3.0	4.82144E-J-1	-6.950562E-J-3	-1.159895E-02	0.0		
29	G	0.0	3.0	7.973J66E-J-1	-1.348993E-J-2	-6.3473d7E-J-2	0.0		
30	G	0.0	3.0	1.375921E+J-0	-1.968470E-J-2	-9.091139E-J-2	0.0		
31	G	0.0	3.0	2.103933E+J-0	-2.611020E-62	-1.192044E-01	0.0		
32	G	0.0	3.0	3.130273E+J-0	-3.511988E-62	-1.553490E-01	0.0		
33	G	0.0	3.0	4.4284U2E+J-0	<del>-4.93952E-62</del>	-1.8111734E-01	0.0		
34	G	0.0	3.0	5.7311994E+J-0	-5.222312E-62	-1.93344E-01	0.0		
35	G	0.0	3.0	6.263557E-J-2	-1.95673d7E-62	-1.95673d7E-62	0.0		
36	G	0.0	3.0	3.8056330C-EJ-2	-1.0305089E-62	-1.02518E-J-3	0.0		
37	G	0.0	3.0	0.0	1.23d686E-13	-1.107923E-02	0.0		
38	G	0.0	3.0	0.1354u7E-u2	-1.059762E-02	-1.775J95E-02	0.0		
39	G	0.0	3.0	2.067464E-J-1	-2.0J9944E-J-2	-3.143J06E-J-2	0.0		
40	G	0.0	3.0	2.65419E-J-1	-1.749537E-J-2	-5.092955E-J-2	0.0		
41	G	0.0	3.0	4.612564E+J-0	-2.370695E-J-2	-7.4553337E-J-2	0.0		
42	G	0.0	3.0	1.652222E+J-0	-3.054637E-J-2	-1.02301688E-J-1	0.0		
43	G	0.0	3.0	2.472986L+J-0	-3.0d9210E-J-2	-3.98538E-J-1	0.0		
44	G	0.0	3.0	3.521378E+J-0	-4.515096E-J-2	-1.647037E-J-1	0.0		
45	G	0.0	3.0	7.5072J2E+J-0	-5.0d92636E-J-2	-5.35342E-J-1	0.0		
46	G	0.0	3.0	9.555463E+J-0	-7.099390E-J-2	-1.934243E-J-1	0.0		
47	G	0.0	3.0	1.1874J2E-J-2	-8.659397E-J-2	-2.033333E-J-1	0.0		
48	G	0.0	3.0	6.0d0195E-J-2	-10.25d47E-J-2	-3.333330E-J-1	0.0		
49	G	0.0	3.0	1.34312E-J-2	-1.714947E-J-2	-4.173d69E-J-2	0.0		
50	G	0.0	3.0	3.374J95E-J-2	-1.0333333E-J-2	-2.173d69E-J-2	0.0		

341-34E COMPOSITE WING FINAL ANALYSIS  
A. J. ZINDEL AEROSTRUCTURES RESEARCH 523JP

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J I S P - A G C H E M E N T V E C T O R						
POINT ID.	TYPE	T1	T2	T3	R1	R2
51	6	0.0	0.0	3.653910E-01	-2.116717E-02	-4.048197E-02
52	6	0.0	0.0	7.195801E-01	-2.794744E-02	-6.137873E-02
53	5	0.0	0.0	1.231322E+00	-3.298065E-02	-8.016320E-02
54	5	0.0	0.0	1.916954E+00	-4.156804E-02	-1.437235E-01
55	5	0.0	0.0	2.739936E+00	-4.890761E-02	-1.439935E-01
56	6	0.0	0.0	3.861301E+00	-5.0949372E-02	-1.721799E-01
57	6	0.0	0.0	5.631534E+00	-5.0459017E-02	-1.8949355E-01
58	5	0.0	0.0	6.205187E+00	-5.023419E-02	-1.950875E-01
59	5	0.0	0.0	7.515276E+00	-5.004000E-02	-1.990000E-01
60	6	0.0	0.0	8.021442E+00	-5.000000E-02	-2.000000E-01
61	5	0.0	0.0	8.670726E-02	-2.059610E-02	-2.579175E-02
62	5	0.0	0.0	4.455892E-01	-2.952393E-02	-4.715592E-02
63	6	0.0	0.0	8.525493E-01	-3.768769E-02	-7.008505E-02
64	6	0.0	0.0	1.414512E+00	-4.035110E-02	-9.658484E-02
65	5	0.0	0.0	2.145722E+00	-4.103872E-02	-1.242703E-01
66	5	0.0	0.0	3.058149E+00	-5.086071E-02	-1.538594E-01
67	5	0.0	0.0	4.144572E+00	-5.015132E-02	-1.783310E-01
68	6	0.0	0.0	5.352546E+00	-5.000000E-02	-1.923266E-01
69	6	0.0	0.0	6.512927E+00	-5.000000E-02	-1.964111E-01
70	5	0.0	0.0	-2.237638E-03	-2.001714E-02	-2.723532E-02
71	6	0.0	0.0	2.117443E-01	-3.005952E-02	-3.587364E-02
72	6	0.0	0.0	5.944443E-01	-3.946154E-02	-5.060044E-02
73	6	0.0	0.0	9.917404E-01	-4.793615E-02	-8.147624E-02
74	6	0.0	0.0	1.634415E+00	-5.010645E-02	-1.074704E-01
75	6	0.0	0.0	2.366182E+00	-6.270431E-02	-1.359179E-01
76	6	0.0	0.0	3.340373E+00	-7.000000E-02	-1.635353E-01
77	6	0.0	0.0	4.442695E+00	-7.936480E-02	-1.857514E-01
78	6	0.0	0.0	6.636172E+00	-8.000000E-02	-1.960330E-01
79	6	0.0	0.0	8.7232E+00	-8.000000E-02	-2.044220E-01
80	6	0.0	0.0	-2.939883E-02	-4.000000E-02	-3.439023E-02
81	6	0.0	0.0	2.650258E-01	-4.751697E-02	-1.635353E-01
82	6	0.0	0.0	4.773411E-01	-5.0447203E-02	-7.291441E-02
83	6	0.0	0.0	6.000000E-01	-6.000000E-02	-9.300000E-02
84	6	0.0	0.0	1.914917E+00	-7.000000E-02	-1.244752E-01
85	6	0.0	0.0	2.785665E+00	-7.998418E-02	-1.551648E-01
86	6	0.0	0.0	3.806742E+00	-8.000000E-02	-1.799461E-01
87	6	0.0	0.0	4.931151E+00	-8.000000E-02	-1.957979E-01
88	6	0.0	0.0	6.033366E+00	-8.000000E-02	-2.000000E-01
89	6	0.0	0.0	7.164142E+00	-8.000000E-02	-2.033843E-01
90	6	0.0	0.0	9.097307E-02	-2.000000E-02	-2.000000E-02
91	6	0.0	0.0	-5.706612E-02	-8.000000E-02	-6.535922E-03
92	6	0.0	0.0	2.336571E-03	-8.000000E-02	-1.487143E-02
93	5	0.0	0.0	2.326951E-03	-2.000000E-02	-3.324673E-02
94	5	0.0	0.0	1.747274E-03	-2.000000E-02	-2.507338E-02
95	5	0.0	0.0	-2.125351E-03	-1.000000E-02	-3.092394E-02
96	5	0.0	0.0	2.477583E-03	-2.000000E-02	-3.584516E-02
97	5	0.0	0.0	-5.141564E-03	-1.000000E-02	-4.930878E-02
98	5	0.0	0.0	6.653256E+00	-5.000000E-02	-1.930875E-01
99	5	0.0	0.0	8.249356E+00	-5.000000E-02	-1.933534E-01

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B41-34E COMPOSITE WING FINAL ANALYSIS  
A.J.ZINNELL AERO STRUCTURES RESEARCH GROUP

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J I S P E L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
14	3	3.0	4.79332E+00	-5.12231E-02	-1.93874E-01	0.0	

B24-34L COMPOSITE WING FINAL ANALYSIS  
A.J.ZINDEL AÉRO STRUCTURES RESEARCH GROUP

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FORCES OF SINGLE-POINT CONSTRAINT

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
11	G	9.0	3.0	0.0	0.0	4.129330E+03	0.0
13	G	0.0	3.0	3.311551E+02	0.0	0.0	0.0
23	G	0.0	0.0	0.0	0.0	1.277354E+04	0.0
25	S	0.0	0.0	2.770329E+02	0.0	0.0	0.0
35	G	0.0	0.0	0.0	0.0	2.540515E+04	0.0
37	G	0.0	0.0	-1.0667338E+02	0.0	0.0	0.0
47	G	0.0	0.0	0.0	0.0	2.362998E+04	0.0
49	G	0.0	0.0	-2.163493E+03	0.0	0.0	0.0
59	G	0.0	0.0	0.0	0.0	1.484989E+04	0.0
51	G	0.0	0.0	-3.204901E+03	0.0	0.0	0.0
161	G	0.0	0.0	0.0	0.0	1.849960E+04	0.0

FORCES IN BENDING TRIANGLES (CTRPLT)

ELEMENT ID.	BEND-MOMENT		TRIST-MOMENT		SHEAR	
	X	Y	X	Y	X	Y
1	9.774233E+02	1.0762556E+01	3.496104E+00	1.032787E+00	-1.165344E+01	-1.165344E+01
2	3.9+221E+01	9.414238E+01	-3.67703E+01	-1.465734E+01	-2.56942E+01	-2.56942E+01
3	1.367773E+01	3.111233E+01	-1.374228E+01	-5.588715E+01	-7.127d0E+01	-7.127d0E+01
4	-6.0+935E+01	1.417d196E+02	-6.775094E+01	-4.896061E+00	-2.617667E+01	-2.617667E+01
5	+4.96631E+01	3.6410977E+01	-2.442492E+01	3.066280E+00	1.719d0E+01	1.719d0E+01
6	1.123222E+02	1.4141843E+02	-5.774214E+01	-1.5109338E+01	-2.899d0E+01	-2.899d0E+01
7	5.428153E+01	3.0154574E+01	-6.821224E+01	1.0313309E+01	0.99912E+00	0.99912E+00
8	1.2d6265E+02	1.1119349E+02	-2.0111114E+00	-2.0111114E+00	-1.709233E+01	-1.709233E+01
9	5.616159E+01	7.13d3345E+01	-4.330936E+01	-0.09918d0E+00	1.265721E+01	1.265721E+01
10	9.357233E+01	1.056803E+02	-8.087773E+01	1.089144E+01	-1.692244E+01	-1.692244E+01
11	3.352238E+01	6.922132E+01	-3.489226E+01	-2.75348d0E+00	1.772d0E+01	1.772d0E+01
12	7.419553E+01	4.205748E+02	-7.4153069E+01	7.6258d0E+00	-3.015237E+01	-3.015237E+01
13	1.2103865E+01	3.041135E+01	-1.2935593E+01	2.06349E+00	2.103223E+01	2.103223E+01
14	3.035593E+01	6.9323292E+01	-4.1442445E+01	2.55533E+00	-3.6167d0E+01	-3.6167d0E+01
15	7.695223E+01	2.931611E+01	-1.3622299E+01	-1.47142E+00	5.1164E+01	5.1164E+01
16	1.2147721E+01	3.767019E+01	-2.20411208E+01	5.9418d0E+00	-7.19753d0E+01	-7.19753d0E+01
17	-9.133134E+02	1.809476E+01	-1.036189E+01	-1.036189E+01	0.4769d0E+00	0.4769d0E+00
18	-8.6092623E+01	2.630335E+01	-1.516359E+01	1.037939E+01	-5.0557d0E+01	-5.0557d0E+01
19	3.299413E+02	9.193468E+02	-3.904347E+02	5.27974E+01	5.163930E+01	5.163930E+01
20	2.5542295E+02	1.073320E+03	-6.561812E+02	-7.013769E+01	5.62724E+01	5.62724E+01
21	4.715011E+02	7.93476E+02	-5.439335E+02	4.784805E+01	5.93220E+01	5.93220E+01
22	6.310446E+02	1.0719302E+03	-7.2695682E+02	-3.87368E+01	-4.465472E+01	-4.465472E+01
23	6.303627E+02	3.0123551E+02	-5.463359E+02	-9.81117E+01	6.92423E+01	6.92423E+01
24	6.718443E+02	1.039112E+03	-7.04288E+02	-3.040978E+01	-5.65b175E+01	-5.65b175E+01
25	2.052113E+02	7.7725415E+02	-5.244344E+02	1.389593E+01	2.571447E+01	2.571447E+01
26	9.024775E+02	8.444916E+02	-6.433344E+02	3.236170E+01	-7.904373E+01	-7.904373E+01
27	4.644511E+02	7.8445332E+02	-5.115077E+02	-1.572027L+01	2.636277E+01	2.636277E+01
28	+9.024775E+02	9.5442923E+02	-4.0409409E+02	+1.73559E+01	-7.4027424E+01	-7.4027424E+01
29	2.982933E+02	2.452171E+02	-5.66116C+02	-3.0448757E+01	6.986337E+01	6.986337E+01
30	3.424334E+02	4.4441336E+02	-2.078709L+02	3.136692L+01	-7.916593E+01	-7.916593E+01
31	1.313J52E+02	3.0J29J29E+02	-1.621508L+02	-1.539974E+01	2.368274E+01	2.368274E+01
32	4.644511E+02	7.8445332E+02	-5.115077E+02	-1.572027L+01	-3.746425E+01	-3.746425E+01
33	2.982933E+02	2.452171E+02	-5.66116C+02	-3.0448757E+01	-7.4027424E+01	-7.4027424E+01
34	3.424334E+02	4.4441336E+02	-2.078709L+02	3.136692L+01	4.982542E+01	4.982542E+01
35	1.313J52E+02	3.0J29J29E+02	-1.621508L+02	-1.539974E+01	-6.654924E+01	-6.654924E+01
36	1.012912E+02	3.245326E+02	-1.96L721E+02	-1.457277E+01	-1.410656E+01	-1.410656E+01
37	1.513J723E+02	3.2072L4E+02	-2.083417E+02	-1.30142E+01	-2.571d0E+01	-2.571d0E+01
38	-2.039314E+02	4.226939E+02	-1.027494E+02	-1.027494E+02	-1.99777E+01	-1.99777E+01
39	-5.034747E+00	6.183357E+01	-4.0978737E+01	-4.0978737E+01	-1.110056E+01	-1.110056E+01
40	-2.447492E+01	2.276742E+01	-4.17002E+01	-1.980243E+01	-1.407627E+01	-1.407627E+01
41	-7.441039E+01	1.759317E+01	-9.056163E+01	8.17585d0E+01	-2.571d0E+01	-2.571d0E+01
42	1.207533E+02	2.589094E+02	-1.291579E+02	-1.291579E+02	-1.99777E+01	-1.99777E+01
43	9.931255E+02	2.0J3774CE+03	-1.611322E+03	1.4442775E+02	6.969741E+01	6.969741E+01
44	3.031451E+02	2.651532E+03	-2.0987125E+03	-2.0987125E+03	-6.7169d0E+01	-6.7169d0E+01
45	0.506441E+02	1.055180E+03	-4.17002E+01	-1.980243E+01	-1.25392E+02	-1.25392E+02
46	0.16035E+02	1.013035E+03	-9.056163E+01	8.17585d0E+01	-1.604935E+02	-1.604935E+02
47	4.048575E+02	9.811424E+02	-9.8611674E+02	-9.8611674E+02	-1.69651E+02	-1.69651E+02
48	1.3032429E+03	1.324292E+03	-1.324292E+03	-1.324292E+03	-1.67160E+02	-1.67160E+02
49	1.013035E+03	1.055180E+03	-1.126288E+03	-1.126288E+03	-1.32149L+02	-1.32149L+02
50	1.013035E+03	1.055180E+03	-1.126288E+03	-1.126288E+03	-1.604935E+02	-1.604935E+02
51	4.048575E+02	9.811424E+02	-9.8611674E+02	-9.8611674E+02	-1.37727d0E+02	-1.37727d0E+02
52	3.031451E+02	4.048575E+02	-4.048575E+02	-4.048575E+02	-1.69651E+02	-1.69651E+02
53	0.506441E+02	0.506441E+02	-1.276742E+02	-1.276742E+02	-1.67160E+02	-1.67160E+02
54	0.16035E+02	0.16035E+02	-0.205180E+02	-0.205180E+02	-1.32149L+02	-1.32149L+02
55	4.048575E+02	4.048575E+02	-5.242093E+02	-5.242093E+02	-1.604935E+02	-1.604935E+02
56	3.031451E+02	3.031451E+02	-3.031451E+02	-3.031451E+02	-1.37727d0E+02	-1.37727d0E+02
57	2.031321E+02	2.031321E+02	-2.031321E+02	-2.031321E+02	-1.69651E+02	-1.69651E+02
58	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
59	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
60	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
61	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
62	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
63	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
64	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
65	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
66	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
67	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
68	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
69	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
70	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
71	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
72	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
73	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
74	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
75	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
76	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
77	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
78	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
79	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
80	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
81	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
82	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
83	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
84	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
85	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
86	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
87	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
88	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
89	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
90	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
91	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
92	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
93	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.604935E+02	-1.604935E+02
94	1.0724492E+02	1.0724492E+02	-1.0724492E+02	-1.0724492E+02	-1.32149L+02	-1.32149L+02
95	1.0724492E+02	1.0724492E+02</				

FORCES IN DENDING

(CTRP LT)

ELEMENT ID.	BEND-MOMENT X	BEND-MOMENT Y	TWIST-MOMENT		TRIANGLES		SHEAR X		SHEAR Y	
			X	Y	X	Y	X	Y	X	Y
59	1.317395E+02	2.226146E+12	-1.505990E+02	-2.715066E+01	3.398267E+01	-3.360432E+01	-1.622335E+01	-1.622335E+01	-1.622335E+01	-1.622335E+01
60	4.911552E+01	4.45519E+02	-4.90053E+02	-4.90144E+02	1.93013E+01	-1.92859E+01	-1.92859E+01	-1.92859E+01	-1.92859E+01	-1.92859E+01
61	1.927175E+01	5.70836E+01	-5.02608E+01	-5.02608E+01	3.02608E+01	-3.02608E+01	-3.02608E+01	-3.02608E+01	-3.02608E+01	-3.02608E+01
62	1.44212E+01	7.373759E+01	-1.35949E+02	-1.35949E+02	8.02175E+01	-8.02175E+01	-8.02175E+01	-8.02175E+01	-8.02175E+01	-8.02175E+01
63	1.22495E+03	7.737759E+02	-9.0770E+02	-9.0770E+02	-1.151357E+02	-1.151357E+02	-1.151357E+02	-1.151357E+02	-1.151357E+02	-1.151357E+02
64	7.559193E+02	4.706948E+02	-2.9476E+03	-2.9476E+03	2.161145E+02	-2.161145E+02	-2.161145E+02	-2.161145E+02	-2.161145E+02	-2.161145E+02
65	2.190725E+03	2.90910E+03	-1.598147E+03							
66	1.42655E+03	3.15967E+03	-3.98145E+03							
67	1.22495E+03	2.98177E+03	-5.26212E+03							
68	7.559193E+02	2.224551E+03	-1.224551E+03							
69	2.190725E+03	2.90910E+03	-1.598147E+03							
70	1.42655E+03	3.15967E+03	-3.98145E+03							
71	1.035037E+03	2.98177E+03	-5.26212E+03							
72	1.150384E+03	2.224551E+03	-1.224551E+03							
73	6.760613E+02	1.150384E+03	-1.846352E+03							
74	3.3980475E+02	1.612541E+03	-2.846352E+03							
75	5.844635E+02	1.426551E+03	-3.98145E+03							
76	5.501694E+02	3.15177E+02	-2.9476E+02							
77	3.15177E+02	2.224551E+02	-1.224551E+02							
78	3.674737E+02	3.04737E+02	-1.91534E+02							
79	1.631239E+02	1.631239E+02	-8.18238E+02							
80	1.9179125E+02	3.098326E+02	-1.91534E+02							
81	3.323143E+02	1.91534E+02	-1.91534E+02							
82	5.905279E+02	1.58452L+02	-1.58452L+02							
83	1.595125E+02	1.595125E+02	-3.98145E+02							
84	1.730536E+02	1.730536E+02	-6.97936E+02							
85	1.450653E+02	1.450653E+02	-4.933939E+02							
86	1.595125E+02	1.595125E+02	-4.621557E+02							
87	1.224551E+02	1.224551E+02	-2.734551E+02							
88	1.450653E+02	1.450653E+02	-4.933939E+02							
89	1.595125E+02	1.595125E+02	-4.621557E+02							
90	1.595125E+02	1.595125E+02	-4.621557E+02							
91	1.615355E+02	1.615355E+02	-2.734551E+02							
92	1.272447E+02	1.272447E+02	-2.699732E+02							
93	7.324553E+02	7.324553E+02	-3.953558E+03							
94	6.515735E+02	6.515735E+02	-3.2583C+03							
95	1.55142E+02	1.55142E+02	-2.647267E+02							
96	0.691791E+02	0.691791E+02	-3.04737E+02							
97	4.747625E+02	4.747625E+02	-8.55795E+02							
98	3.23015E+02	3.23015E+02	-1.34313L+02							
99	2.85521E+02	2.85521E+02	-6.227174E+02							
100	1.930995E+02	2.949371E+02	-2.949371E+02							
101	1.522425E+02	3.04737E+02	-1.713143E+02							
102	1.071337E+02	1.071337E+02	-1.98714L+02							
103	5.197465E+01	1.033915E+02	-1.933915E+02							
104	4.33445E+01	4.33445E+01	-4.33445E+01							
105	6.93032E+01	6.93032E+01	-2.723635E+01							
106	2.113104E+01	2.113104E+01	-2.113104E+01							
107	1.316173E+01	1.316173E+01	-3.746764E+02							
108	6.858397E+01	6.858397E+01	-4.721797E+02							
109	2.393322E+01	2.393322E+01	-2.6151372E+02							
110	2.648382E+02	2.648382E+02	-9.51040E+02							
111	2.984713E+02	2.984713E+02	-7.324553E+02							
112	1.930342E+02	1.930342E+02	-1.329371E+02							
113	1.919361E+02	1.919361E+02	-1.61127E+02							
114	1.24732E+02	1.24732E+02	-1.715750E+02							
115	1.24732E+02	1.24732E+02	-1.715750E+02							

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FORCES IN BENDING TRIANGLES

(CTR PLT)

ELEMENT ID.	BEND-MOMENT		TWIST-MOMENT		SHEAR X		SHEAR Y	
	X	Y	X	Y	X	Y	X	Y
117	1.1d6394e+32	-2.538767e+42	-1.504753e+02	-2.250816e+01	-2.08215e+01	-3.347625e+00	-1.576326e+01	-1.79374e+01
118	-3.051237e+31	1.498578e+02	-9.369373e+01	-1.79374e+01	-1.576326e+01	-6.32476e+01	-6.32476e+01	-6.32476e+01
119	3.047243e+31	1.233874e+02	-8.045566e+01	-3.022094e+01	-6.379391e+00	-5.379391e+00	-6.44603e+01	-6.44603e+01
120	-3.048291e+31	2.72224e+01	-2.02739e+01	-2.02739e+01	-6.402595e+00	-6.402595e+00	-7.022363e+00	-7.022363e+00
121	1.866212e+01	-2.03739e+01	-1.1e-3040e+01	-3.059489e+00	-2.028220e+00	-3.028757e+00	-2.105457e+01	-2.105457e+01
122	6.54634e+01	-7.471574e+01	-5.95358e+01	-5.95358e+01	-5.184143e+00	-5.184143e+00	-3.492184e+00	-3.492184e+00
123	1.152613e+01	1.695558e+01	-3.089147e+00	-2.704140e+01	-2.635688e+00	-3.096290e+00	-3.096290e+00	-3.096290e+00
124	1.617293e+01	-7.148226e+01	-3.089147e+00	-2.704140e+01	-2.635688e+00	-3.096290e+00	-3.096290e+00	-3.096290e+00
125	1.1e-7492e+01	4.086325e+01	-2.704140e+01	-2.704140e+01	-1.399307e+00	-1.399307e+00	-1.46692e+01	-1.46692e+01
126	1.052343e+01	1.863234e+01	-6.0254349e+01	-6.0254349e+01	-6.235616e+00	-6.235616e+00	-6.42022e+01	-6.42022e+01
127	3.168340e+01	1.245139e+02	-3.0244115e+01	-3.0244115e+01	-2.847252e+00	-2.847252e+00	-2.951644e+01	-2.951644e+01
128	7.750753e+00	3.593340e+01	-1.074304e+01	-1.074304e+01	-4.928458e+00	-4.928458e+00	-3.744612e+01	-3.744612e+01
129	2.335241e+01	7.252934e+01	-1.963407e+01	-1.963407e+01	-3.935164e+00	-3.935164e+00	-5.97182E-02	-5.97182E-02
130	5.023739e+01	3.498770e+01	-9.914049e+00	-9.914049e+00	-5.775143e+00	-5.775143e+00	-1.490049e+01	-1.490049e+01
131	1.839625e+01	1.898724e+01	-2.009426e+01	-2.009426e+01	-1.705033e+00	-1.705033e+00	-2.49772je+01	-2.49772je+01
132	-1.164335e+00	1.164335e+00	-5.468114e+00	-5.468114e+00	-4.359536e+00	-4.359536e+00	-6.40214e+01	-6.40214e+01
133	1.403263e+01	3.538311e+01	-1.244670e+01	-1.244670e+01	-4.560297e+00	-4.560297e+00	-4.97182e+01	-4.97182e+01
134	3.658895e+01	1.232034e+01	-4.560297e+00	-4.560297e+00	-1.392835e+00	-1.392835e+00	-8.09049e+01	-8.09049e+01
135	1.839625e+01	2.582376e+01	-1.262664e+01	-1.262664e+01	-1.587776e+00	-1.587776e+00	-5.180201e-01	-5.180201e-01
136	3.415757e+00	7.368559e+00	-3.932065e+00	-3.932065e+00	-4.9202592e+00	-4.9202592e+00	-1.674138e+01	-1.674138e+01
137	1.624492e+01	1.55867112e+01	-1.6092112e+01	-1.6092112e+01	-8.746660e-01	-8.746660e-01	-6.184357e-01	-6.184357e-01
138	1.1673971e+00	1.57670e+00	-1.614433e+01	-1.614433e+01	-2.317939e+00	-2.317939e+00	-3.478450e+01	-3.478450e+01
139	5.0523935e+00	2.0582311e+01	-2.022311e+01	-2.022311e+01	-3.006934e-01	-3.006934e-01	-5.180201e-01	-5.180201e-01
140	1.6158233e+01	1.452147e+01	-6.438570e-01	-6.438570e-01	-2.395268e-01	-2.395268e-01	-1.038088e-01	-1.038088e-01
141	5.115235e+01	3.3593311e+00	-2.3953311e+00	-2.3953311e+00	-1.725377e-01	-1.725377e-01	-5.179440e-01	-5.179440e-01
142	-1.659180e+01	2.485369e+01	-3.5853505e-01	-3.5853505e-01	-1.663134e+01	-1.663134e+01	-1.075393e+01	-1.075393e+01
143	2.004713e+03	2.550542e+03	-2.550542e+03	-2.550542e+03	-7.283529e+01	-7.283529e+01	-2.454690e+02	-2.454690e+02
144	-1.413975e+03	2.437259e+03	-2.437259e+03	-2.437259e+03	-1.521628e+03	-1.521628e+03	-4.666870e+02	-4.666870e+02
145	7.587653e+02	*4.945391e+03	-3.10476e+03	-3.10476e+03	-2.370535e+03	-2.370535e+03	-3.239362e+02	-3.239362e+02
146	1.305303e+03	3.022655e+03	-1.54429e+03	-1.54429e+03	-1.275903e+03	-1.275903e+03	-3.90707e+01	-3.90707e+01
147	1.316912L+03	2.416329e+03	-1.673971e+03	-1.673971e+03	-1.353161e+02	-1.353161e+02	-8.658152e+01	-8.658152e+01
148	1.077524e+03	1.938299e+03	-1.938299e+03	-1.938299e+03	-1.302195e+02	-1.302195e+02	-4.317697e+01	-4.317697e+01
149	4.625393e+02	8.173471e+02	-7.376393e+02	-7.376393e+02	-1.089955e+02	-1.089955e+02	-1.089955e+02	-1.089955e+02
150	1.637653e+02	1.077524e+02	-2.186012e+02	-2.186012e+02	-1.184587e+01	-1.184587e+01	-1.184587e+01	-1.184587e+01

FORCES IN DEDDING QUADRILATERALS

( C Q O P L T )

ELEMENT ID.	BEND-MOMENT		TWIST-MOMENT		SHEAR	
	X	Y	X	Y	X	Y
151	4.983511E+01	1.259625E+03	-5.907062E+04	2.0474742E+01	1.933552E+01	
152	5.802035E+01	3.097516E+02	-1.691953E+02	2.0446944E+01	6.447348E+01	
153	1.531102E+02	2.0151127E+03	-6.913795E+01	4.021112E+01	1.51914dE+01	
154	1.636321E+02	2.0369255E+03	-2.351547E+02	4.022294E+01	4.55ba77E+01	
155	2.046203E+02	4.048522E+03	-8.244754E+01	5.45756E+01	-1.63b206E+01	
156	3.069373E+02	4.0214724E+03	-5.025058E+02	5.022795E+01	1.633518E+01	
157	3.029042E+02	5.0230538E+03	-6.0588244E+01	7.0380028E+01	-1.692459E+01	
158	3.308651E+02	4.0396245E+03	-2.407325E+02	1.045715E+02	-0.533645E+02	
159	2.629643E+02	2.0520585E+03	-2.081573E+02	2.092007E+01	-1.373027E+01	
160	3.088731E+02	0.1202933E+03	-1.044479E+02	2.079386E+02	-8.147008E+01	

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3Q1-34E COMPOSITE WING, FINAL ANALYSIS  
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FORCES IN JAR ELEMENTS (C B A R)

ELEMENT ID.	BEND-MOMENT END-A		BEND-MOMENT END-B		SHEAR - PLANE 1		AXIAL FORCE	
	PLANE 1	PLANE 2	PLANE 1	PLANE 2	PLANE 1	PLANE 2	PLANE 1	PLANE 2
261	6.58416E+03	0.0	6.557115E+03	0.0	-2.41593E+01	0.0	0.0	0.0
202	6.40226E+03	0.0	7.27703E+03	0.0	-4.94525E+02	0.0	2.94238E-01	0.0
203	5.937171E+02	0.0	6.654623E+02	0.0	-2.53337E+01	0.0	-1.45904E+01	0.0
204	6.649563E+02	0.0	6.119733E+02	0.0	1.177258E+01	0.0	2.437634E-02	0.0
205	5.347563E+02	0.0	3.78154E+02	0.0	2.043214E+01	0.0	6.930511E-02	0.0
211	1.598366E+02	0.0	-1.08251E+03	0.0	-4.14146E+02	0.0	-4.99710E+02	0.0
212	7.339721E+01	0.0	-2.657424E+02	0.0	0.460495E+02	0.0	-3.208065E+02	0.0
213	4.398345E+02	0.0	-4.390039E+02	0.0	1.658372E+02	0.0	-2.913572E+02	0.0
214	5.278345E+02	0.0	-2.433141E+02	0.0	6.958239E+01	0.0	-1.225565E+02	0.0
215	1.731574E+02	0.0	-1.467053E+02	0.0	3.650212E+01	0.0	-6.834454E-02	0.0
221	-8.357971E+01	0.0	-6.253875E+01	0.0	1.911342E+01	0.0	-8.93430E+01	0.0
222	-7.213157E+01	0.0	-4.361413E+00	0.0	-1.013456E+01	0.0	-3.93350E+00	0.0
223	1.627603E+01	0.0	6.455753E-01	0.0	3.408318E-01	0.0	-6.900220E+01	0.0
224	1.990398E+01	0.0	-5.927458E+00	0.0	1.099427E+01	0.0	-5.634571E+01	0.0
231	3.0	0	-2.214571E-08	0.0	5.287335E-09	0.0	-1.882649E-09	0.0
232	-1.430116E-08	0.0	-2.214644E-08	0.0	1.002045E-09	0.0	-3.02499E-09	0.0
233	1.340316E+01	0.0	2.539625E+01	0.0	-4.154253E+01	0.0	-3.876212E+01	0.0
234	-8.242239E+01	0.0	-1.149933E+02	0.0	1.230759E+01	0.0	7.463521E+01	0.0
235	1.335328E-07	0.0	7.157273E-08	0.0	6.319228E-09	0.0	7.450564E-09	0.0
236	5.387935E-03	0.0	-4.470348E-06	0.0	2.235174E-08	0.0		

STRESSES IN 3 ENDING TRIANGLES (CTRPLT)

STRESSES IN ELEMENT COORD SYSTEM  
NORMAL-X SHEAR-Y

MAX  
SHEAR

ELEMENT ID.	FIBRE DISTANCE	NORMAL-X ANGLE	PRINCIPAL STRESSES (ZERO SHEAR) MAJOR MINOR	NASTRAN 0/15/72	PAGE 26
1	-2.369309E-91	-3.793571E+3	-9.870975E+C2	-1.957618E+02	-1.024056E+01
	-2.369309E-91	3.793571E+3	9.375875E+02	1.357818E+02	-3.375439E+J1
2	-4.609309E-91	-1.296500E+3	-3.1J93581E+3	1.29659E+3	3.375439E+01
	-4.609309E-91	1.296320E+3	3.1J93581E+3	-1.28339E+3	-3.375439E+J1
3	-2.3600J03E-91	-1.4J+3620E+3	-2.386167E+03	1.053307E+03	-3.700664E+J3
	-2.3600J03E-91	1.343626E+3	2.386167E+03	-1.053307E+03	3.09163E+J2
4	-4.000000E-91	-2.329784E+03	-4.262550E+03	2.493869E+03	-5.96531E+J3
	-4.000000E-91	2.329784E+3	4.262550E+03	-2.463388E+03	4.09489E+J2
5	-2.520000E-01	-6.104312E+3	-4.010610E+03	1.526557E+03	-5.149856E+J3
	-2.520000E-01	3.104312E+3	4.010610E+03	-1.526557E+03	1.905067E+J3
6	-3.7600J0E-01	-4.017690E+3	-4.094243E+03	2.373842E+03	-2.281816E+03
	-3.7600J0E-01	4.517680E+3	4.094243E+03	-2.373842E+03	-4.54619
7	-2.3600J03E-01	-4.161515E+03	-3.951840E+03	2.161962E+03	-1.891117E+03
	-2.3600J03E-01	4.161515E+03	3.951840E+03	-2.161962E+03	-4.30125
8	-3.460000E-01	-5.127880E+3	-4.759336E+03	3.60956E+03	-6.016962E+J3
	-3.460000E-01	5.127880E+3	4.759336E+03	-3.60956E+03	1.071278E+J3
9	-2.1CJ000E-01	-3.930597E+3	-5.014424E+03	3.031655E+03	-1.392803E+03
	-2.1CJ000E-01	3.930597E+3	5.014424E+03	-3.031655E+03	-5.06073
10	-3.160000E-01	-4.079602E+3	-5.469602E+03	4.4883E+03	-7.552219E+03
	-3.160000E-01	4.079602E+3	5.469602E+03	-4.4883E+03	-47.5142
11	1.000000E-01	-2.883408E+03	-6.0276025E+03	3.257705E+03	-9.851794E+02
	1.000000E-01	2.383408E+03	6.0276025E+03	-3.257705E+03	-59.7773
12	2.7600J03E-01	-4.065551E+3	-6.527233E+03	3.835566E+03	-1.229470E+03
	-2.7600J03E-01	4.065551E+3	6.527233E+03	-3.835566E+03	-54.0949
13	-1.6000J03E-01	-1.951850E+03	-4.865316E+03	2.69749E+03	-9.76383E+02
	-1.6000J03E-01	1.951850E+03	4.865316E+03	-2.69749E+03	-62.5794
14	-2.400000E-91	-2.82879E+03	-5.046262E+03	3.315396E+03	-6.417213E+02
	-2.400000E-91	2.382679E+03	5.046262E+03	-3.315396E+03	-55.9413
15	-1.4000J03E-01	-1.077332E+03	-3.21425E+03	1.97219E+03	3.03927
	-1.4000J03E-01	1.077332E+03	3.21425E+03	-1.97219E+03	-59.6473
16	2.0000J03E-01	-1.514721E+03	-3.767019E+03	2.21153E+03	-1.665231E+J2
	-2.0000J03E-01	1.514721E+03	3.767019E+03	-2.21153E+03	-56.5516

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STRESSES IN JENDING TRAILERS

STRESSES IN ELEMENT COORD SYSTEM

NORMAL-Y

STRESSES IN ELEMENT COORD SYSTEM

PRINCIPAL STRESSES (ZERO SHEAR)

ANGLE

STRESSES IN ELEMENT COORD SYSTEM

MAJOR

MINOR

MAX

SHEAR

ELEMENT ID. DISTANCE FIGURE

17 1.239000E-31 -1.239000E-31

-1.11970E+31 1.11970E+31

2.171371E+63 -2.171371E+63

1.243427E+03 -1.243427E+03

1.243427E+03 -1.243427E+03

2.43654E+02 -2.43654E+02

2.73459E+03 -2.73459E+03

5.741574E+02 -5.741574E+02

2.73459E+03 -2.73459E+03

1.65453E+03 -1.65453E+03

USAF-34E COMPOSITE WING FINAL ANALYSIS  
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STRESSES IN ELEMENTS IN STRESSES IN ELEMENT COORD SYSTEM

NORMAL-X

FIRE EARTH DISTANCE NORMAL-Y JOURNAL-X SHEAR-Y ANGLE-XY

MAX SHEAR

ELEMENT ID.	TRIANGLES (CTRPLT)			PRINCIPAL STRESSES (ZERO SHEAR)		
	ANGLE	MAJOR	MINOR	ANGLE	MAJOR	MINOR
37 -3.103300E-01 -3.103300E-01	-3.345186E+03 3.45186E+03	-7.101063E+03 7.101063E+03	5.277262E+03 -5.277250E+03	3.784025E+02 1.032525E+04	-1.032525E+02 -5.784425E+02	5.601026E+03 5.601028E+03
38 -3.303300E-01 -3.303300E-01	-2.541056E+03 2.541056E+03	-5.745617E+03 5.793817E+03	4.774544E+03 -4.774544E+03	5.5943 -54.4557	8.763127E+02 9.211196E+03	5.643754E+03 5.643754E+03
39 2.633300E-01 -2.633300E-01	3.650841E+02 -3.650841E+02	-4.319182E+03 4.319182E+03	3.66336E+03 -3.66336E+03	4.1663 -5.5943	1.951732E+03 5.594330E+03	3.771281E+03 3.771281E+03
40 -2.769330E-01 -2.769330E-01	-1.350821E+03 -1.350821E+03	-2.049444E+03 2.049444E+03	2.25561E+03 -2.25561E+03	2.6930 -60.5373	2.290623E+03 3.639243E+03	3.064933E+03 3.064933E+03
41 -7.903300E-01 -7.903300E-01	-4.290836E+03 4.290836E+03	-1.044343E+04 1.044343E+04	5.271166E+03 -5.2071166E+03	3.5220 -59.6730	-1.245361E+03 1.319390E+04	5.974276E+03 5.974276E+03
42 -7.833300E-01 -7.833300E-01	-5.245442E+03 5.245442E+03	-1.257781E+04 1.257781E+04	6.296445E+03 -6.296445E+03	2.8253 -66.1747	-1.594642E+03 1.013751E+04	7.296335E+03 7.296335E+03
43 -7.403330E-01 -7.403330E-01	-5.460244E+03 5.460244E+03	-1.116983E+04 1.116983E+04	0.642581E+03 -0.642581E+03	3.3717 -56.6233	-1.049498E+03 1.55451E+04	7.233958E+03 7.233958E+03
44 -7.463300E-01 -7.463300E-01	-6.452981E+03 6.452981E+03	-1.372199E+04 1.372199E+04	8.169628E+03 -8.169628E+03	3.5391 -56.4333	-1.42283E+03 1.914969E+04	8.362204E+03 8.362204E+03
45 -7.003300E-01 -7.003300E-01	-7.614096E+03 7.614096E+03	-1.329631E+04 1.329631E+04	7.957111E+03 -7.957111E+03	3.5173 -54.8233	-2.007155E+03 1.039158E+04	8.49347E+03 8.49347E+03
46 -7.033300E-01 -7.033300E-01	-9.578956E+03 9.578956E+03	-1.444789E+04 1.444789E+04	9.155214E+03 -9.155214E+03	3.7555 -52.4425	-2.54000E+03 2.143678E+04	8.540060E+03 8.540060E+03
47 -7.033300E-01 -7.033300E-01	-8.391248E+03 8.391248E+03	-1.043450E+04 1.043450E+04	9.413820E+03 -9.413820E+03	3.64175 -54.5325	-2.197225E+03 2.212852E+04	9.965647E+03 9.965647E+03
48 -5.303300E-01 -5.303300E-01	-9.352618E+03 9.352618E+03	-1.515492E+04 1.515492E+04	9.969332E+03 -9.969332E+03	3.6741 -53.1259	-1.874489E+03 2.204305E+04	1.038428E+04 1.038428E+04
49 -5.633300E-01 -5.633300E-01	-8.506266E+03 8.506266E+03	-1.0667417E+04 1.0667417E+04	1.032373E+04 -1.032373E+04	3.9106 -56.0334	-1.766630E+03 2.341406E+04	1.082372E+04 1.082372E+04
50 -5.603300E-01 -5.603300E-01	-9.302880E+03 9.302880E+03	-1.523743E+04 1.523743E+04	1.617175E+04 -1.617175E+04	3.68696 -53.1314	-1.674443E+03 2.286597E+04	1.059571E+04 1.059571E+04
51 -5.103300E-01 -5.103300E-01	-7.683710E+03 7.683710E+03	-1.468432E+04 1.468432E+04	9.548097L+03 -9.548097L+03	34.9336 -55.0054	-1.04537E+03 2.13539E+04	1.010948E+04 1.010948E+04
52 -5.053300E-01 -5.053300E-01	-8.356974E+03 8.356974E+03	-1.28383E+04 1.28383E+04	9.647952E+03 -9.647952E+03	39.2195 -50.7315	-1.63856E+03 2.075705E+04	9.846898E+03 9.846898E+03

AQ4-34E COMPOSITE WING FINAL ANALYSIS  
A. J. ZINDEL AERO STRUCTURES RESEARCH GROUP

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( C T R P L T )									
STRESSES IN 3-D DILATING TRINGLE SYSTEM (ZERO SHEAR)									
ELEMENT ID.	FLUID DISTANCE	NORMAL-X		NORMAL-Y		SHEAR-XV		PRINCIPAL STRESSES (ZERO SHEAR)	
		ANGLE	ANGLE	ANGLE	ANGLE	MAJOR	MINOR	HINER	SHEAR
57	4.551000E-01 -4.551000E-01	-7.152884E+03 7.152884E+03	-1.760593E+04 1.760593E+04	9.076010E+03 -9.076010E+03	29.9137 -29.9137	-1.831014E+03 2.022777E+04	-2.022777E+04 2.022777E+04	1.049838E+04 1.049838E+04	1.049838E+04 1.049838E+04
58	4.043000E-01 -4.043000E-01	-7.058764E+03 7.058764E+03	-1.445520E+04 1.445520E+04	8.333053E+03 -8.333053E+03	36.0833 -56.1957	-2.0083053E+03 2.0083053E+03	-2.0083053E+03 2.0083053E+03	9.013350E+03 9.013350E+03	9.013350E+03 9.013350E+03
59	3.630000E-01 -3.630000E-01	-3.804909E+03 3.804909E+03	-8.436567E+03 8.436567E+03	5.722762E+03 -5.722762E+03	34.01196 -55.6354	1.161431E+04 1.231314E+04	-1.161431E+04 -1.161431E+04	6.162575E+03 6.162575E+03	6.162575E+03 6.162575E+03
60	3.070000E-01 -3.070000E-01	-2.0114881E+03 2.0114881E+03	-2.0114881E+03 2.0114881E+03	-5.982975E+03 4.463797E+03	33.0679 -56.9321	9.344696E+02 8.911445E+03	-3.044449E+03 -3.044449E+03	4.902867E+03 4.902867E+03	4.902867E+03 4.902867E+03
61	3.203000E-01 -3.203000E-01	-4.092655E+01 +4.092655E+01	-4.092655E+01 +4.092655E+01	-4.077354E+03 4.477834E+03	2.619547E+03 -2.619547E+03	1.107474E+03 -65.1652	1.107474E+03 -5.65537E+03	-2.008257E+03 -1.161747E+03	3.423193E+03 3.423193E+03
62	3.161000E-01 -3.161000E-01	-7.045953E+02 7.045953E+02	-3.24696E+03 3.24696E+03	1.503727E+03 -1.503727E+03	25.6710 -64.0293	8.493663E+03 3.998499E+03	-3.998499E+03 -6.493663E+03	2.032594E+03 2.032594E+03	2.032594E+03 2.032594E+03
63	8.000000E-01 -8.000000E-01	-5.036169E+03 5.036169E+03	-1.718377E+04 1.718377E+04	7.078113E+03 -7.078113E+03	25.0392 -64.0398	-2.276726E+03 2.054622E+04	-2.054322E+04 2.276726E+03	9.133624E+03 9.133624E+03	9.133624E+03 9.133624E+03
64	8.000000E-01 -8.000000E-01	-5.716933E+03 5.716933E+03	-2.254825E+04 2.254825E+04	4.0345283E+03 -4.0345283E+03	1.233906 -77.5134	-2.702630E+03 2.355256E+04	-2.355256E+03 2.762633E+03	1.036136E+04 1.036136E+04	1.036136E+04 1.036136E+04
65	7.900000E-01 -7.900000E-01	-1.26391E+04 1.26391E+04	-1.487663E+04 1.487663E+04	1.044096E+04 -1.044096E+04	40.0050 -49.9120	-2.556725E+03 2.638878E+04	-2.556725E+03 2.638878E+04	1.04566072E+03 2.0356725E+03	1.04566072E+03 2.0356725E+03
66	7.360000E-01 -7.360000E-01	-3.0197879E+03 3.0197879E+03	-3.0197879E+03 3.0197879E+03	-8.692485E+04 1.592135E+04	31.02774 -58.4220	-2.901393E+03 2.221693E+04	-2.221693E+03 2.301393E+03	9.657726E+03 9.657726E+03	9.657726E+03 9.657726E+03
67	7.100000E-01 -7.100000E-01	-7.099769E+03 7.099769E+03	-1.669262E+04 1.085325E+04	9.0717926E+03 -9.0717926E+03	31.08973 -58.231460E+03	-1.927959E+03 -58.1327	-1.927959E+03 2.020810E+04	1.0356136E+04 1.0356136E+04	1.0356136E+04 1.0356136E+04
68	5.760000E-01 -5.760000E-01	-8.338259E+03 8.252469E+03	-1.091408E+04 1.084693E+04	9.0717926E+03 -1.021518E+04	33.07178 -57.3857	-2.901969E+03 2.333933E+04	-2.901969E+03 2.448224E+04	1.051420E+04 1.051420E+04	1.051420E+04 1.051420E+04
69	5.000000E-01 -5.000000E-01	-9.077708E+03 9.577708E+03	-9.077708E+03 9.577708E+03	-1.091408E+04 -1.021518E+04	32.01943 -57.3857	-1.819157E+03 2.448224E+04	-1.819157E+03 2.0481629E+04	1.051420E+04 1.051420E+04	1.051420E+04 1.051420E+04
70	5.800000E-01 -5.800000E-01	-9.338108E+03 9.333105E+03	-9.338108E+03 9.333105E+03	-1.091408E+04 -1.021518E+04	32.08021 -57.4433	-1.949838E+03 2.448224E+04	-1.949838E+03 2.0481629E+04	1.051420E+04 1.051420E+04	1.051420E+04 1.051420E+04
71	5.000000E-01 -5.000000E-01	-9.077708E+03 9.577708E+03	-9.077708E+03 9.577708E+03	-1.091408E+04 -1.021518E+04	32.01943 -57.3857	-1.819157E+03 2.448224E+04	-1.819157E+03 2.0481629E+04	1.051420E+04 1.051420E+04	1.051420E+04 1.051420E+04
72	5.760000E-01 -5.760000E-01	-8.338259E+03 8.252469E+03	-8.338259E+03 8.252469E+03	-1.091408E+04 -1.084693E+04	32.01943 -57.3857	-1.819157E+03 2.448224E+04	-1.819157E+03 2.0481629E+04	1.051420E+04 1.051420E+04	1.051420E+04 1.051420E+04
73	5.800000E-01 -5.800000E-01	-9.077708E+03 9.577708E+03	-9.077708E+03 9.577708E+03	-1.091408E+04 -1.084693E+04	32.01943 -57.3857	-1.819157E+03 2.448224E+04	-1.819157E+03 2.0481629E+04	1.051420E+04 1.051420E+04	1.051420E+04 1.051420E+04
74	5.000000E-01 -5.000000E-01	-9.077708E+03 9.577708E+03	-9.077708E+03 9.577708E+03	-1.091408E+04 -1.021518E+04	32.01943 -57.3857	-1.949838E+03 2.448224E+04	-1.949838E+03 2.0481629E+04	1.051420E+04 1.051420E+04	1.051420E+04 1.051420E+04
75	5.800000E-01 -5.800000E-01	-9.338108E+03 9.333105E+03	-9.338108E+03 9.333105E+03	-1.091408E+04 -1.056189E+04	32.08021 -57.4433	-1.949838E+03 2.448224E+04	-1.949838E+03 2.0481629E+04	1.051420E+04 1.051420E+04	1.051420E+04 1.051420E+04
76	5.000000E-01 -5.000000E-01	-9.077708E+03 9.577708E+03	-9.077708E+03 9.577708E+03	-1.091408E+04 -1.021518E+04	36.2765 -56.7235	-2.070556E+03 2.382918E+03	-2.070556E+03 2.382918E+03	1.051542E+04 1.051542E+04	1.051542E+04 1.051542E+04

STRESSES IN ELEMENTS IN ELEMENT COORD SYSTEM (UTRPLT)

STRESSES IN ELEMENT COORD SYSTEM (ZERO SHEAR)

MAX  
SHEAR

MINOR  
ANGLE

MAJOR  
ANGLE

PRINCIPAL STRESSES (ZERO SHEAR)

NORMAL-X

SHEAR-Y

NORMAL-Y

SHEAR-X

ANGLE-XY

ANGLE-ZY

ANGLE-ZX

ANGLE-YZ

ANGLE-YX

ANGLE-XZ

ANGLE-XY

ANGLE-ZX

ANGLE-ZY

ANGLE-YZ

ANGLE-XZ

ANGLE-XY</

STRESSES IN JENDING TRIANGLE

STRESSES IN ELEMENT SYSTEM

NORMAL-X SHEAR-Y

FIBRE DISTANCE

ANGLE

MAX

SHEAR

PRINCIPAL STRESSES (ZERO SHEAR)

MAJOR MINOR

ANGLE

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STRESSES IN JET ROLLING TIRIANGLE ELEMENTS

STRESSES IN ELEMENT GUARD SYSTEM

NORMAL-X

ANGLE SHEAR-XY

ANGLE

NORMAL-Y

ANGLE

SHAR

ANGLE

PRINCIPAL STRESSES (ZERO SHEAR)

ANGLE

MAJOR

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MINOR

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STRESSES IN BENDING TRIANGLES (CTRPLT)

STRESSES IN ELEMENT COORD SYSTEM (ZERO SHEAR)

MAX SHEAR

ELEMENT ID.	FIBRE DISTANCE	NORMAL-X	NORMA-Y	SHEAR-X	ANGLE	PRINCIPAL STRESSES (ZERO SHEAR)	MINOR	MAX
123	2.103399E-01	-2.499603E+03	-7.013243E+03	2.061640E+03	-1.9.35E+03	-1.727727E+03	-3.335394E+03	3.303835E+03
	-2.103399E-01	2.449036E+03	7.613213E+03	-2.061640E+03	-7.06951	8.335394E+03	1.0727727E+03	3.303835E+03
130	1.103603E-01	-5.911115E+02	-3.848664E+03	1.696611E+03	16.9029	-2.536975E+02	-4.18078E+03	1.96196E+03
	-1.103603E-01	5.911115E+02	3.848664E+03	-1.696611E+03	-7.03971	4.18078E+03	2.536975E+02	1.96196E+03
131	1.903399E-01	-1.795143E+02	-6.906169E+03	1.906983E+03	18.380	-1.103850E+03	-7.540462E+03	3.189806E+03
	-1.903399E-01	1.795143E+02	6.906169E+03	-1.906983E+03	-7.1622J	7.540462E+03	1.103850E+03	3.189806E+03
132	-1.603005E-01	-1.041084E+03	-4.745810E+03	1.352028E+03	18.0591	-6.002422E+02	-5.077052E+03	2.293705E+03
	-1.033005E-01	1.041084E+03	4.745810E+03	-1.352028E+03	-7.19439	5.077052E+03	6.002422E+02	2.293705E+03
133	1.733399E-01	-1.372438E+03	-6.014663E+03	2.115940E+03	23.0156	-1.30743E+03	-6.919648E+03	2.926143E+03
	-1.703399E-01	1.372438E+03	6.014663E+03	-2.115940E+03	-6.083+	6.919648E+03	1.007443E+03	2.926143E+03
134	9.020006E-02	-1.0157651E+03	-3.097902E+03	1.350089E+03	23.3743	-5.741420E+02	-4.281410E+03	1.053634E+03
	-9.000006E-02	1.0157651E+03	3.097902E+03	-1.350089E+03	-6.06260	4.281410E+03	5.741420E+02	1.053634E+03
135	1.500000E-01	-1.020735E+03	-3.873556E+03	1.894326E+03	30.77+0	-6.925195E+02	-2.0001079E+03	2.019453E+03
	-1.500000E-01	1.020735E+03	3.873556E+03	-1.894326E+03	-5.92252	5.0001079E+03	6.920155E+02	2.019453E+03
136	8.003399E-02	-9.103351E+02	-1.964943E+03	1.648714E+03	31.653J	-2.638249E+02	-2.011459E+03	1.173017E+03
	-8.003399E-02	9.103351E+02	1.964943E+03	-1.648714E+03	-5.83470	2.011459E+03	2.038249E+02	1.173017E+03
137	1.400000E-01	-1.428689E+03	-2.171997E+03	1.513239E+03	38.1037	-2.417035E+02	-3.035798E+03	1.558146E+03
	-1.400000E-01	1.428689E+03	2.171997E+03	-1.513239E+03	-5.1893	3.035798E+03	2.417035E+02	1.558146E+03
138	-7.030030E-02	-5.058894E+02	-5.514144E+02	6.341800E+02	45.7795	b.575230E+01	-1.203096E+03	6.344142E+02
	-7.030030E-02	5.058894E+02	5.514144E+02	-6.341800E+02	-44.2215	1.203096E+03	-5.576236E+01	6.344142E+02
139	1.250000E-01	-6.634599E+02	3.093373E+01	7.339729E+02	56.7691	5.0092560E+02	-1.0485298E+03	7.972771E+02
	-1.250000E-01	6.634599E+02	-3.093373E+01	-7.339729E+02	-3.52339	1.0485298E+03	-2.092560E+02	7.972771E+02
140	5.000000E-02	-8.712679E+01	5.0663262E+02	2.111678E+02	72.2777	5.738013E+02	-1.546099E+02	3.642056E+02
	-5.000000E-02	8.712679E+01	-5.0663262E+02	-2.111678E+02	-17.723	1.546099E+02	-2.738013E+02	3.642056E+02
141	1.000000E-01	-1.278809E+02	5.898452E+02	3.494214E+02	67.0019	7.318594E+02	-2.698951E+02	5.003772E+02
	-1.000000E-01	1.278809E+02	-5.898452E+02	-3.494214E+02	-22.1191	2.698951E+02	-7.318594E+02	5.003772E+02
142	2.000000E-02	-1.920099E+01	2.742685E+02	1.792532E+02	58.4774	3.842103E+02	-1.798285E+03	2.010960E+02
	-2.000000E-02	-2.195639E+01	-2.742685E+02	-1.792532E+02	-31.5223	1.798285E+03	-3.842103E+02	2.010960E+02
143	7.500000E-01	-1.53427E+04	-1.301297E+04	9.637829E+03	41.3249	-2.08190E+03	2.14510E+04	2.080190E+03
	-7.500000E-01	1.53427E+04	1.301297E+04	-9.637829E+03	-48.0731	2.14510E+04	-2.08190E+03	2.080190E+03
144	7.300000E-01	-8.46900E+03	-1.18615E+04	-3.679349E+03	35.0230	-1.913029E+03	-2.03220E+04	9.205399E+03
	-7.300000E-01	8.46900E+03	1.18615E+04	-3.679349E+03	-54.7371	2.03220E+04	-1.913029E+03	9.205399E+03

## STRESSES IN 3 CIN JIN 6 TRIANGLES

STRESSES IN ELEMENT

NORMAL-X

NORMAL-Y

SHEAR-X

SHEAR-Y

ANGLE

PRINCIPAL STRESSES (IZRO)

MAJOR

MINOR

SHEAR

## (CTR P LT)

STRESSES (IZRO SHEAR)

ANGLE

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ELEMENT - FIRE

DISTANCE

NORMAL-X

NORMAL-Y

SHEAR-X

SHEAR-Y

ANGLE

PRINCIPAL STRESSES (IZRO)

MAJOR

MINOR

SHEAR

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ELEMENT ID.	FIRE DISTANCE	STRESSES IN ENDING QUADRATIC ELEMENT SYSTEM			PRINCIPAL STRESSES (ZERO SHEAR)			C Q J P L T		
		NORMAL-X		ANGLE	MAJOR		MINOR		MAX SHEAR	
		SHEAR-X	SHEAR-Y		MAJOR		MINOR		MAX SHEAR	
151	8.10000E-01 - -8.10000E-01	-3.308791E+02 3.308791E+02	-7.033541E+03 7.033541E+03	2.594033E+02 -2.594033E+02	2.2124 -0.0576E+02	-3.020576E+02 7.04535E+03	-7.045243E+03 3.020576E+02	-7.045243E+03 3.020576E+02	5.362289E+03 5.362289E+03	5.362289E+03 5.362289E+03
152	8.10000E-01 - -8.10000E-01	-3.333684E+02 3.333684E+02	-5.0223286E+03 2.0223286E+03	7.0421741E+02 -7.0421741E+02	0.4379 -0.15021	-2.232117E+02 5.336383E+03	-5.336383E+03 2.232117E+02	-5.336383E+03 2.232117E+02	2.555555E+03 2.555555E+03	2.555555E+03 2.555555E+03
153	8.10000E-01 - -8.10000E-01	-1.033527E+03 1.033527E+03	-1.0452011E+04 1.0452011E+04	4.630311E+02 -4.630311E+02	1.9795 -0.0215	-1.0417398E+03 1.453024E+04	-1.0417398E+03 1.0417398E+03	-1.0417398E+03 1.0417398E+03	6.759424E+03 6.759424E+03	6.759424E+03 6.759424E+03
154	8.10000E-01 - -8.10000E-01	-9.140827E+02 9.140827E+02	-1.151069E+04 1.151069E+04	1.0313623E+03 -1.0313623E+03	6.9024 -83.0376	-7.536601E+02 1.107110E+04	-1.107110E+04 7.530001E+02	-1.107110E+04 7.530001E+02	5.0450719E+03 5.0450719E+03	5.0450719E+03 5.0450719E+03
155	8.10000E-01 - -8.10000E-01	-1.767725E+03 1.767725E+03	-2.029137E+04 2.029137E+04	4.946850E+02 -4.946850E+02	1.2576 -88.7424	-1.756856E+03 2.43223E+04	-1.756856E+03 1.750000E+03	-1.756856E+03 1.750000E+03	1.0427268E+04 1.0427268E+04	1.0427268E+04 1.0427268E+04
156	8.10000E-01 - -8.10000E-01	-1.463674E+03 1.463674E+03	-1.0996448E+04 1.0996448E+04	1.047133E+03 -1.047133E+03	4.04456 -85.0544	-1.351193E+03 2.007693E+04	-1.351193E+03 1.351193E+03	-2.007693E+03 1.351193E+03	9.362945E+03 9.362945E+03	9.362945E+03 9.362945E+03
157	8.10000E-01 - -8.10000E-01	-2.029778E+03 -2.029778E+03	-5.0138353E+04 -5.0138353E+04	3.0952394E+02 -3.0952394E+02	7.795 -89.2215	-2.029410E+03 0.138330E+04	-3.013830E+03 2.029406E+03	-3.013830E+03 2.029406E+03	1.0454245E+04 1.0454245E+04	1.0454245E+04 1.0454245E+04
158	8.10000E-01 - -8.10000E-01	-1.048281E+03 -1.048281E+03	-2.0735144E+04 -2.0735144E+04	-1.034501E+03 -1.034501E+03	3.0137 -86.9893	-1.777538E+03 2.742218E+04	-1.777538E+03 1.777538E+03	-1.777538E+03 1.777538E+03	1.0282254E+04 1.0282254E+04	1.0282254E+04 1.0282254E+04
159	8.10000E-01 - -8.10000E-01	-1.510649E+03 -1.510649E+03	-3.0173123E+04 -3.0173123E+04	1.368138E+03 -1.368138E+03	2.5d58 -87.4132	-1.0448037E+03 3.017305E+04	-1.0448037E+03 1.0448037E+04	-1.0448037E+03 1.0448037E+04	1.517210E+04 1.517210E+04	1.517210E+04 1.517210E+04
160	-8.10000E-01 - -8.10000E-01	-4.065412E+03 -4.065412E+03	-3.016922E+04 -3.016922E+04	5.0834466E+03 -5.0834466E+03	10.6833 -79.1137	-3.0843039E+04 3.0843039E+04	-3.0843039E+04 3.0843039E+04	-3.0843039E+04 3.0843039E+04	1.0573368E+04 1.0573368E+04	1.0573368E+04 1.0573368E+04

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BQ1-34E COMPOSITE WING FINAL ANALYSIS  
A.J.ZINDEL AERO STRUCTURES RESEARCH 580J2

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STRESS ELEMENTS IN SA3 S33 S32 S42 S41

ELEMENT ID.	SA4			SA4			SA4			SA4			SA4			SA4		
	S44	S45	S46	S34	S35	S36	S33	S34	S35	S36	S33	S34	S35	S36	S33	S34	S35	S36
201	-3.344545E+03	3.344545E+03	3.403334E+03	3.403334E+03	-3.295361E+03	-3.353821E+03	3.295361E+03	3.353821E+03	3.295361E+03	3.353821E+03	3.344545E+03	3.403334E+03	-3.344545E+03	-3.403334E+03	3.344545E+03	3.403334E+03	-3.344545E+03	-3.403334E+03
202	-3.675361E+03	-4.177391E+03	3.675361E+03	4.177391E+03	-3.675361E+03	-4.177391E+03	3.675361E+03	4.177391E+03	3.675361E+03	4.177391E+03	3.675361E+03	4.177391E+03	-3.675361E+03	-4.177391E+03	3.675361E+03	4.177391E+03	-3.675361E+03	-4.177391E+03
203	-3.314393E+02	-3.397365E+02	3.314393E+02	3.397365E+02	-3.314393E+02	-3.397365E+02	3.314393E+02	3.397365E+02	3.314393E+02	3.397365E+02	3.314393E+02	3.397365E+02	-3.314393E+02	-3.397365E+02	3.314393E+02	3.397365E+02	-3.314393E+02	-3.397365E+02
204	-4.730818E+02	-4.353911E+02	4.730818E+02	4.353911E+02	-4.730818E+02	-4.353911E+02	4.730818E+02	4.353911E+02	4.730818E+02	4.353911E+02	4.730818E+02	4.353911E+02	-4.730818E+02	-4.353911E+02	4.730818E+02	4.353911E+02	-4.730818E+02	-4.353911E+02
205	-3.435235E+02	-2.416733E+02	3.435235E+02	2.416733E+02	-3.435235E+02	-2.416733E+02	3.435235E+02	2.416733E+02	3.435235E+02	2.416733E+02	3.435235E+02	2.416733E+02	-3.435235E+02	-2.416733E+02	3.435235E+02	2.416733E+02	-3.435235E+02	-2.416733E+02
211	-8.669640E+01	-5.669640E+01	8.669640E+01	5.669640E+01	-8.669640E+01	-5.669640E+01	8.669640E+01	5.669640E+01	8.669640E+01	5.669640E+01	8.669640E+01	5.669640E+01	-8.669640E+01	-5.669640E+01	8.669640E+01	5.669640E+01	-8.669640E+01	-5.669640E+01
212	-1.738399E+02	-5.89536E+02	1.738399E+02	5.89536E+02	-1.738399E+02	-5.89536E+02	1.738399E+02	5.89536E+02	1.738399E+02	5.89536E+02	1.738399E+02	5.89536E+02	-1.738399E+02	-5.89536E+02	1.738399E+02	5.89536E+02	-1.738399E+02	-5.89536E+02
213	-9.731486E+02	-9.660332E+02	9.731486E+02	9.660332E+02	-9.731486E+02	-9.660332E+02	9.731486E+02	9.660332E+02	9.731486E+02	9.660332E+02	9.731486E+02	9.660332E+02	-9.731486E+02	-9.660332E+02	9.731486E+02	9.660332E+02	-9.731486E+02	-9.660332E+02
214	-3.140862E+02	-6.166195E+02	3.140862E+02	6.166195E+02	-3.140862E+02	-6.166195E+02	3.140862E+02	6.166195E+02	3.140862E+02	6.166195E+02	3.140862E+02	6.166195E+02	-3.140862E+02	-6.166195E+02	3.140862E+02	6.166195E+02	-3.140862E+02	-6.166195E+02
215	-4.645759E+02	-3.938256E+02	4.645759E+02	3.938256E+02	-4.645759E+02	-3.938256E+02	4.645759E+02	3.938256E+02	4.645759E+02	3.938256E+02	4.645759E+02	3.938256E+02	-4.645759E+02	-3.938256E+02	4.645759E+02	3.938256E+02	-4.645759E+02	-3.938256E+02
221	2.037457E+02	1.522434U1E+02	-2.037457E+02	-1.522434U1E+02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
222	1.754733E+02	1.0553157E+02	-1.754733E+02	-1.0553157E+02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
223	-3.968474E+01	-1.574363E+01	3.968474E+01	1.574363E+01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
224	-4.452100E+02	-1.445181E+02	4.452100E+02	1.445181E+02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
231	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
232	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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JG-34E COMPOSITE MING FINA ANALYSIS  
A.J.ZINDEL AERO STRUCTURES RESEARCH GROUP

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NADG-73235-30

ELEMENT ID.	STRESS STATE				BAR ELEMENTS				( CADAR )			
	S41	S42	S43	S44	SAY	SA3	SA2	SA1	SA-MAX	SA-MIN	SB-MAX	SB-MIN
233	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
234	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
235	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
236	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

**NADC-73235-30**

**A P P E N D I X C**

**NASTRAN VIBRATION ANALYSIS OUTPUT DATA**

FTGFN VALUE = 1.6092456L+04

## REAL FREQUENCY NUMBER NO. 1

POINT NO.	TYPE	T1	T2	T3	R1	R2	R3
1	6	0.0	0.0	2.496893E-05	-6.35624E-05	-5.689043E-05	0.0
2	6	0.0	0.0	2.452854E-04	-7.250932E-15	-3.6494627E-15	0.0
3	6	0.0	0.0	2.041138E-04	-2.674279E-04	7.76044E-07	0.0
4	6	0.0	0.0	-1.655724E-03	-7.414392E-04	5.79502E-04	0.0
5	6	0.0	0.0	-1.441446E-02	-1.421476E-03	2.015745E-03	0.0
6	6	0.0	0.0	-6.424297E-02	-2.15031E-03	4.485262E-03	0.0
7	6	0.0	0.0	-9.450497E-02	-7.041551E-02	8.745776E-13	0.0
8	6	0.0	0.0	-1.649320E-01	-3.335543E-02	1.444671E-02	0.0
9	6	0.0	0.0	-3.473745E-01	-7.373422E-02	2.2644964E-02	0.0
10	6	0.0	0.0	-5.519407E-01	-1.041223E-02	3.014169E-02	0.0
11	6	0.0	0.0	-4.0404279E-05	3.232903E-05	0.0	0.0
12	6	0.0	0.0	-3.740419E-05	2.82794E-05	-1.635567E-05	0.0
13	6	0.0	0.0	3.00	7.312456E-06	-9.81734E-06	0.0
14	6	0.0	0.0	-4.0111090E-05	-6.37449E-05	5.47364E-05	0.0
15	6	0.0	0.0	-1.522293E-05	-3.415233E-04	4.0763261E-04	0.0
16	6	0.0	0.0	-8.601454E-05	-7.4424104E-04	1.4462756E-03	0.0
17	6	0.0	0.0	-2.74394E-05	-1.2145457E-03	3.2076580E-03	0.0
18	6	0.0	0.0	-6.4647791E-02	-1.73954E-02	6.10673E-03	0.0
19	6	0.0	0.0	-1.295439E-01	-2.64811E-02	1.015917E-02	0.0
20	6	0.0	0.0	-2.391890E-01	-2.790962E-01	1.729615E-02	0.0
21	6	0.0	0.0	-4.050470E-01	-2.454597E-01	2.467904E-12	0.0
22	6	0.0	0.0	-6.113733E-01	-1.279334E-01	5.1111129E-02	0.0
23	6	0.0	0.0	6.0-315/E-04	8.13840E-05	0.0	0.0
24	6	0.0	0.0	4.724464E-04	5.744441E-05	6.464455E-05	0.0
25	6	0.0	0.0	3.00	-2.526513E-05	9.164471E-05	0.0
26	6	0.0	0.0	-1.32281E-03	-3.964221E-05	4.31544E-05	0.0
27	6	0.0	0.0	-6.801624E-03	-2.76059E-04	1.203753E-03	0.0
28	6	0.0	0.0	-2.674739E-02	-4.216363E-04	2.582645E-03	0.0
29	6	0.0	0.0	-4.736345E-02	-6.469674E-04	4.93946E-03	0.0
30	6	0.0	0.0	-9.636196E-02	-9.287794E-04	8.376757E-03	0.0
31	6	0.0	0.0	-1.743160E-01	-1.351459E-03	1.274532E-02	0.0
32	6	0.0	0.0	-2.958400E-01	-1.25512E-03	1.99337E-02	0.0
33	6	0.0	0.0	-4.0724291E-01	-8.394325E-04	2.608155E-02	0.0
34	6	0.0	0.0	-6.751643E-01	5.207032E-04	3.046677E-02	0.0
35	6	0.0	0.0	-2.59431E-03	1.518793E-04	0.0	0.0
36	6	0.0	0.0	1.053016E-07	9.228374E-05	2.566637E-04	0.0
37	6	0.0	0.0	0.0	-9.354353E-05	+4.76613F-04	0.0
38	6	0.0	0.0	-4.776333E-03	2.85274E-04	1.0211934E-03	0.0
39	6	0.0	0.0	-1.680158E-02	1.7E9230E-04	2.0776AE-03	0.0
40	6	0.0	0.0	-3.6582338E-02	2.572974E-04	3.092393E-03	0.0
41	6	0.0	0.0	-7.276059E-02	3.049083E-04	5.555035E-03	0.0
42	6	0.0	0.0	-1.7274465E-01	2.692336E-04	1.01673AE-02	0.0
43	6	0.0	0.0	-2.34319E-01	1.39E74E-04	4.548977E-12	0.0
44	6	0.0	0.0	-3.684491E-01	5.247735E-04	2.80444L-02	0.0
45	6	0.0	0.0	-5.409699E-01	5.022552E-04	2.899216E-02	0.0
46	6	0.0	0.0	-7.790696E-01	4.179413E-04	3.221557E-02	0.0
47	6	0.0	0.0	4.839429E-03	2.365690E-04	0.0	0.0
48	6	0.0	0.0	3.057905E-03	1.596428E-04	5.465557E-04	0.0
49	6	0.0	0.0	1.047737E-04	-1.1467737E-04	9.304646L-04	0.0
50	6	0.0	0.0	-2.171677E-03	1.0024992E-03	1.301102L-03	0.0

FREQ VALUE = 1.619210E+4

## R F A L E I C E N V E C T O R S N O . 1

POINT ID.	TYPE	T1	T2	T3	T4	R1	R2	R3
51	C	0.0	-2.500452E-02	1.044294E-13	7.129785E-07	0.0	0.0	0.0
62	C	0.0	-5.374968E-02	1.748743E-03	5.734120E-03	0.0	0.0	0.0
57	C	0.0	-1.056810E-01	1.651571E-04	9.49071E-04	0.0	0.0	0.0
54	C	0.0	-1.722557E-01	1.959495E-03	1.282445E-02	0.0	0.0	0.0
26	C	0.0	-2.765920E-01	1.955257E-02	1.85016E-02	0.0	0.0	0.0
66	C	0.0	-4.272449E-01	2.04139E-03	2.573679E-02	0.0	0.0	0.0
57	C	0.0	-8.038077E-01	1.615154E-03	3.07339E-02	0.0	0.0	0.0
58	C	0.0	-8.038169E-01	1.4321915E-04	3.259397E-02	0.0	0.0	0.0
69	C	0.0	-5.4956529E-03	2.747510E-04	9.13	0.0	0.0	0.0
60	C	0.0	4.017681E-03	2.138012E-04	7.230465E-04	0.0	0.0	0.0
61	C	0.0	0.0	-6.796144E-05	1.614454E-03	0.0	0.0	0.0
62	C	0.0	-6.5690237E-03	1.764930E-07	1.972949E-03	0.0	0.0	0.0
67	C	0.0	-3.0410845E-02	1.978744E-07	3.981581E-02	1.0	0.0	0.0
64	C	0.0	-0.397171E-02	2.577812E-05	6.748535E-03	0.0	0.0	0.0
65	C	0.0	-1.055842E-01	3.150614E-03	1.135726E-02	0.0	0.0	0.0
66	C	0.0	-2.078946E-01	5.556170E-03	1.512627E-02	0.0	0.0	0.0
67	C	0.0	-3.04906E-01	3.641673E-03	2.131329E-02	0.0	0.0	0.0
68	C	0.0	-4.793856E-01	7.549494E-03	2.745495E-02	0.0	0.0	0.0
69	C	0.0	-9.68421E-01	2.512344E-03	3.124244E-02	0.0	0.0	0.0
70	C	0.0	-8.571020E-01	1.461933E-03	7.326813E-04	0.0	0.0	0.0
71	C	0.0	-6.656665E-02	2.144441E-07	2.243375E-03	0.0	0.0	0.0
72	C	0.0	-4.035625E-02	-7.399165E-04	3.844555E-03	0.0	0.0	0.0
73	C	0.0	-4.035625E-02	3.215997E-03	5.167044E-03	0.0	0.0	0.0
74	C	0.0	-8.737375E-02	4.212655E-03	8.326837E-03	0.0	0.0	0.0
75	C	0.0	-1.53290E-01	6.393635E-07	1.23081E-02	0.0	0.0	0.0
76	C	0.0	-2.47131E-01	5.655512E-03	1.77892E-02	0.0	0.0	0.0
77	C	0.0	-3.752367E-01	5.422305E-07	2.598795E-02	0.0	0.0	0.0
78	C	0.0	-5.404905E-01	4.798898E-03	2.939393E-02	0.0	0.0	0.0
79	C	0.0	-7.737931E-01	3.344744E-07	3.325014E-02	0.0	0.0	0.0
80	C	0.0	-9.982821E-01	2.377950E-03	5.424243E-02	0.0	0.0	0.0
81	C	0.0	-1.237460E-01	5.257577E-07	3.229939E-02	0.0	0.0	0.0
82	C	0.0	-1.516709E-01	5.415465E-07	6.265461E-02	0.0	0.0	0.0
83	C	0.0	-5.624741E-02	6.074593E-03	7.307354E-03	0.0	0.0	0.0
84	C	0.0	-1.053642E-01	7.014273E-03	1.066273E-02	0.0	0.0	0.0
85	C	0.0	-1.995857E-01	8.38074E-03	1.520754E-02	0.0	0.0	0.0
86	C	0.0	-2.174577E-01	9.958991E-03	2.272726E-02	0.0	0.0	0.0
87	C	0.0	-4.685904E-01	8.214571E-03	2.895196E-02	0.0	0.0	0.0
88	C	0.0	-5.407420E-01	5.712047E-03	7.347157E-02	0.0	0.0	0.0
89	C	0.0	-9.607775E-01	7.465234E-03	3.466027E-02	0.0	0.0	0.0
90	C	0.0	-5.783039E-01	1.52137E-04	1.066273E-02	0.0	0.0	0.0
91	C	0.0	-4.75165E-03	5.99025E-04	9.349029E-04	0.0	0.0	0.0
92	C	0.0	-1.125175E-04	9.935153E-04	9.134495E-04	0.0	0.0	0.0
93	C	0.0	-1.655935E-04	-1.134495E-04	2.143304E-02	0.0	0.0	0.0
94	C	0.0	-1.066777E-02	7.155293E-04	1.743254E-02	0.0	0.0	0.0
95	C	0.0	-1.427044E-02	-8.394398E-04	2.425945E-03	0.0	0.0	0.0
96	C	0.0	-1.792019E-02	1.607655E-03	2.827548E-03	0.0	0.0	0.0
97	C	0.0	-1.000000E+00	-7.151751E-04	3.347327E-02	0.0	0.0	0.0
98	C	0.0	-9.957751E-01	-2.047337E-04	2.296961E-02	0.0	0.0	0.0
99	C	0.0	-7.72749E-01	7.047191E-04	2.158029E-02	0.0	0.0	0.0
100	C	0.0	-4.780176E-01	8.416535E-04	2.167061E-02	0.0	0.0	0.0

FINAL VIBRATION MODES ANALYSIS

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NAIDC-73235-30

## REAL F T GENERATOR NO.

POINT No.	TYPE	T1	T2	T3	R1	R2	R3
1	C	3.0	-2.337938E-03	4.58755E-04	-2.26134E-04	0.0	0.0
2	G	2.0	5.61947E-04	2.313904E-04	-3.247045E-04	3.0	0.0
3	C	1.0	6.754257E-03	0.337275E-04	-1.460075E-03	0.0	0.0
4	G	0.0	3.119792E-02	0.654672E-04	-4.62888E-03	0.0	0.0
5	C	-1.0	9.020034E-02	1.559016E-04	-9.73377E-03	0.0	0.0
6	C	0.0	1.051052E-01	-2.667894E-03	-1.546704E-02	0.0	0.0
7	C	1.0	3.745587E-01	-4.592925E-03	-1.9205775E-02	0.0	0.0
8	A	0.0	4.673212E-01	-1.026619E-02	-1.5027648E-02	1.0	0.0
9	G	0.0	2.945544E-01	-3.178165E-02	-4.62765E-03	0.0	0.0
10	C	0.0	2.542773E-01	-7.315375E-02	3.414852E-02	0.0	0.0
11	C	0.0	-1.515710E-01	-1.917125E-02	0.0	0.0	
12	C	-1.0	-1.175239E-03	-1.20457E-04	-1.702647E-04	0.0	0.0
13	C	0.0	0.0	4.325931E-05	-2.65495E-04	0.0	0.0
14	G	0.0	3.692744E-03	-2.725535E-05	-1.726138E-07	0.0	0.0
15	C	0.0	1.052210E-02	3.217933E-04	-3.50516E-03	0.0	0.0
16	C	0.0	5.579392E-03	-1.676150E-04	-6.484366E-04	0.0	0.0
17	C	0.0	1.271965E-01	-1.946071E-02	-1.333117E-12	0.0	0.0
18	C	0.0	2.3544174E-01	-5.111395E-03	-1.563257E-12	0.0	0.0
19	C	0.0	3.6494656E-01	-1.039847E-02	-1.598449E-12	0.0	0.0
20	C	0.0	4.693412E-01	-2.150684E-02	-9.522511E-12	0.0	0.0
21	C	0.0	4.4161604E-01	-2.968522E-02	1.272925E-12	0.0	0.0
22	C	0.0	2.143752E-01	-3.754725E-02	4.497342E-12	0.0	0.0
23	C	0.0	-5.02974E-01	-3.547321E-04	0.0	0.0	
24	C	0.0	-3.6772332E-01	-2.104693E-04	-5.246656E-04	0.0	0.0
25	C	0.0	0.0	1.68895E-04	-3.48880E-04	0.0	0.0
26	C	0.0	1.0479876E-02	-7.729790E-04	-2.369997E-03	0.0	0.0
27	C	0.0	3.6572870E-02	-2.467550E-04	-4.79703E-03	0.0	0.0
28	C	0.0	8.551979E-02	-7.264397E-03	-3.0445387E-03	0.0	0.0
29	C	0.0	1.65353E-01	-4.6265475E-02	-1.244227E-02	0.0	0.0
30	C	0.0	2.536555E-01	-7.766097E-03	-1.484467E-02	0.0	0.0
31	C	0.0	3.745673E-01	-1.325594E-02	-1.261417E-02	0.0	0.0
32	C	0.0	7.229770E-01	-7.044527E-02	7.147444E-04	0.0	0.0
33	C	0.0	2.203752E-01	-2.963893E-02	2.208794E-02	0.0	0.0
34	C	0.0	5.397517E-02	-3.497724E-02	5.716927E-02	0.0	0.0
35	C	0.0	-1.406739E-02	-6.627074E-04	4.0	0.0	
36	C	0.0	-7.000000E-03	-2.457472E-04	-1.247705F-03	0.0	0.0
37	C	0.0	2.841578E-04	-2.40093E-03	-2.40093E-03	0.0	0.0
38	C	0.0	1.8779389E-02	-2.195399E-02	-7.667945E-03	0.0	0.0
39	C	0.0	5.4510457E-02	-2.574897E-02	-6.367767E-03	0.0	0.0
40	C	0.0	1.011170E-01	-4.153710E-03	-9.900720E-03	0.0	0.0
41	C	0.0	1.971921E-01	-6.163188E-03	-1.258423E-02	1.0	0.0
42	C	0.0	2.0007029E-01	-3.929111E-03	-1.252722E-02	0.0	0.0
43	C	0.0	3.6813736E-01	-1.315945E-02	-6.359935E-03	0.0	0.0
44	C	0.0	3.431269E-01	-1.938755E-02	1.215447E-02	0.0	0.0
45	C	0.0	1.732050E-01	-7.85812E-02	3.923846F-02	0.0	0.0
46	C	0.0	-1.4673675E-01	-3.033939E-02	5.99771E-02	0.0	0.0
47	C	0.0	-1.682376E-01	-4.537096E-02	0.0	0.0	
48	C	0.0	-1.2465596E-02	-2.977251E-04	-1.9288996E-07	0.0	0.0
49	C	0.0	2.28571F-04	-3.520365E-03	-4.0473932E-03	0.0	0.0
50	C	0.0	-1.6331951E-02	-3.135399L-02	-4.0473932E-03	0.0	0.0

LT FNUAL = 1.035934LT+.5

## REAL ELEMENT NUMBER NO.

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
c1	6	.0	.0	7.405825E-02	-4.241570E-03	-8.0120720E-03	0.0
c2	6	.0	.0	1.409987E-01	-5.394392E-01	-1.086360E-02	1.0
53	6	.0	.0	2.232649E-01	-6.587659E-03	-1.196446E-02	0.0
54	6	.0	.0	2.773940E-01	-8.126989E-07	-8.723950E-03	0.0
55	6	.0	.0	3.202053E-01	-1.0173454E-02	2.320675E-07	0.0
56	6	.0	.0	2.4021945E-01	-1.597791E-02	2.442272E-02	0.0
57	6	.0	.0	4.094256E-07	-2.515746E-02	5.164876E-02	0.0
58	6	.0	.0	-3.459261E-01	-5.91379E-02	6.357643E-02	0.0
59	6	.0	.0	-2.059829E-02	-7.321753E-04	1.0	0.0
60	6	.0	.0	-1.547521E-02	-5.712375E-04	-2.776E+3E-02	1.0
61	6	.0	.0	2.0	2.125349E-04	-4.957597E-03	0.0
62	6	.0	.0	2.0	4.01184E-05	-5.41177E-03	0.0
63	6	.0	.0	9.215241E-02	-4.953783E-03	-9.269224E-03	0.0
64	6	.0	.0	1.0640247E-01	-5.388059E-07	-1.161689E-02	0.0
65	6	.0	.0	2.0412496E-01	-5.167139E-03	-1.089917E-02	1.0
66	6	.0	.0	2.0554210E-01	-4.380139E-02	-4.309445E-03	0.0
67	6	.0	.0	2.0396133E-01	-6.355119E-03	1.196159E-02	0.0
68	6	.0	.0	1.0399762E-01	-1.0856935E-02	7.592532E-02	0.0
69	6	.0	.0	-1.517189E-01	-2.02324E-02	6.165852E-12	0.0
70	6	.0	.0	-5.17624E-02	-3.230502E-02	5.997650E-02	0.0
71	6	.0	.0	2.022786E-01	-4.944435E-03	-6.717363E-03	0.0
72	6	.0	.0	5.0196675E-02	2.380935E-03	-9.0297525E-03	0.0
73	6	.0	.0	1.0158452E-01	-5.01275E-03	-1.121097E-02	1.0
74	6	.0	.0	1.0498936E-01	-3.659593E-07	-1.254003E-02	0.0
75	6	.0	.0	2.063690E-01	-1.126114E-13	-0.399899E-03	0.0
76	6	.0	.0	2.097710E-01	1.534695E-03	1.722670E-03	1.0
77	6	.0	.0	2.022786E-01	1.545274E-03	2.217474E-02	0.0
78	6	.0	.0	1.0209328E-02	-4.7751E-03	5.025672E-02	0.0
79	6	.0	.0	-3.0376506E-01	-1.575421E-02	6.090048E-32	0.0
80	6	.0	.0	-7.077390E-01	-2.407339E-02	7.914660E-04	0.0
81	6	.0	.0	6.023249E-02	-2.559722E-07	-1.116106E-02	0.0
82	6	.0	.0	1.069434E-01	-3.41919AE-03	-1.422435E-02	0.0
83	6	.0	.0	2.017854E-01	-0.210425E-04	-1.93277E-02	0.0
84	6	.0	.0	2.093737E-01	4.357431E-07	-1.072569E-02	0.0
85	6	.0	.0	3.071296E-01	1.524950E-02	-0.303329E-03	0.0
86	6	.0	.0	3.031037E-01	2.23270E-02	1.535746E-02	0.0
87	6	.0	.0	1.069307E-01	1.917035E-02	4.563732E-02	0.0
88	6	.0	.0	-2.420757E-01	1.545853E-03	7.55017E-02	0.0
89	6	.0	.0	-7.742528E-01	-1.634751E-02	8.035294E-02	0.0
90	6	.0	.0	-1.891326E-02	-3.649798E-04	0.0	0.0
91	6	.0	.0	-1.0477E-02	-1.716976E-03	-1.344785E-07	0.0
92	6	.0	.0	3.25576E-04	-2.791251E-03	-2.04900E-03	0.0
93	6	.0	.0	3.776496E-04	4.449324E-04	-6.332261E-03	0.0
94	6	.0	.0	3.006007E-02	-3.246601E-07	-5.249512E-03	1.0
95	6	.0	.0	4.078976E-02	1.087594E-03	-7.26554E-02	0.0
96	6	.0	.0	5.015334E-02	-4.73527L-03	-7.42549E-03	0.0
97	6	.0	.0	-1.030005E-01	4.036491E-02	5.039132E-02	0.0
98	6	.0	.0	-5.011798E-01	-4.0324970E-02	6.0769209E-02	0.0
99	6	.0	.0	-7.042079E-01	-3.055539E-02	5.041554E-02	0.0
100	6	.0	.0	6.645770E-01	-2.996025E-02	6.024214E-02	0.0

L1CNUVALUF = 2.0947, 1E+05

## REAL FIGUREN FACTOR NO.

3

POINT	ID#	TYPE	T1	T2	T3	R1	R2	R3
1	6	0..0	-2.10764727E-13	-2.10764727E-14	4.07494400E-14	0..0	0..0	0..0
2	6	0..0	-1.0777795E-17	-1.0846394E-05	4.19760E-14	0..0	0..0	0..0
3	6	0..0	-3.02109E-13	2.7565577E-04	1.304297E-03	0..0	0..0	0..0
4	6	0..0	-2.0343600E-02	1.376796E-03	2.043774E-03	0..0	0..0	0..0
5	6	0..0	-4.0323314E-12	3.777257E-02	2.674567E-03	0..0	0..0	0..0
6	6	0..0	-6.0244454E-02	7.118754E-03	3.120000E-03	0..0	0..0	0..0
7	6	0..0	-8.0992764E-02	1.0235957E-02	5.606140E-03	0..0	0..0	0..0
8	6	0..0	-1.0514764E-01	1.2061355E-02	1.052454E-02	0..0	0..0	0..0
9	6	0..0	-3.011924E-01	3.9559725E-02	2.0307707E-02	0..0	0..0	0..0
10	6	0..0	-4.0943795E-01	5.0524606E-02	2.376423E-02	0..0	0..0	0..0
11	6	0..0	-1.0554710E-03	7.176191E-05	0..0	0..0	0..0	0..0
12	6	0..0	-1.197448E-07	4.026432F-05	1.0768671E-04	0..0	0..0	0..0
13	6	0..0	0..0	-2.0593189E-05	2.0977901E-04	0..0	0..0	0..0
14	6	0..0	-3.0320561E-03	2.0498542F-04	7.500216E-04	0..0	0..0	0..0
15	6	0..0	-1.0233724E-02	7.0072133E-04	1.309227E-02	0..0	0..0	0..0
16	6	0..0	-2.0438203E-02	2.0408241E-03	1.420000E-03	0..0	0..0	0..0
17	6	0..0	-3.051084E-03	5.0222929E-03	1.276411E-03	0..0	0..0	0..0
18	6	0..0	-4.0476647E-02	9.0521454E-02	1.0911502E-02	0..0	0..0	0..0
19	6	0..0	-6.003742E-02	1.5909727E-02	5.084579E-03	0..0	0..0	0..0
20	6	0..0	-1.0712205E-01	2.0364359E-02	1.0524413E-02	0..0	0..0	0..0
21	6	0..0	-2.0055394E-01	4.0472133E-02	2.0525788E-02	0..0	0..0	0..0
22	6	0..0	-4.0427797E-01	6.0022797E-02	2.0708169E-02	0..0	0..0	0..0
23	6	0..0	-2.0921469E-03	7.0274064E-05	0..0	0..0	0..0	0..0
24	6	0..0	-2.0001670E-03	2.0001670E-05	3.000000E-04	0..0	0..0	0..0
25	6	0..0	-1.000000E-04	-1.000000E-04	5.000000E-04	0..0	0..0	0..0
26	6	0..0	-5.0415211E-13	6.000000E-04	7.000000E-04	0..0	0..0	0..0
27	6	0..0	-1.0102057E-02	1.000000E-03	5.000000E-04	0..0	0..0	0..0
28	6	0..0	-1.0415239E-02	4.000000E-03	-1.051505AF-04	1..0	1..0	1..0
29	6	0..0	-1.0700725E-02	7.000000E-03	-6.000000E-04	0..0	0..0	0..0
30	6	0..0	-1.0320357E-03	1.000000E-02	2.0125437E-04	0..0	0..0	0..0
31	6	0..0	-1.0829904E-02	2.000000E-02	7.000000E-03	0..0	0..0	0..0
32	6	0..0	-7.0000707E-02	3.000000E-02	1.000000E-02	0..0	0..0	0..0
33	6	0..0	-7.000076015E-01	5.000000E-02	2.000000E-02	0..0	0..0	0..0
34	6	0..0	-7.000042560E-11	7.000000E-02	1.000000E-02	0..0	0..0	0..0
35	6	0..0	-1.000000E-03	-2.000000E-04	0..0	0..0	0..0	0..0
36	6	0..0	-1.000000E-03	-1.000000E-04	2.000000E-04	0..0	0..0	0..0
37	6	0..0	0..0	1.000000E-04	5.000000E-04	0..0	0..0	0..0
38	6	0..0	-2.000000E-03	1.000000E-03	-4.000000E-03	0..0	0..0	0..0
39	6	0..0	-4.000000E-14	4.000000E-03	-1.000000E-03	0..0	0..0	0..0
40	6	0..0	-1.000000E-02	2.000000E-02	2.000000E-02	0..0	0..0	0..0
41	6	0..0	-7.000000E-02	4.000000E-02	-3.000000E-02	0..0	0..0	0..0
42	6	0..0	-5.000000E-02	5.000000E-02	-2.000000E-02	0..0	0..0	0..0
43	6	0..0	-5.000000E-02	7.000000E-02	-1.000000E-02	0..0	0..0	0..0
44	6	0..0	-4.000000E-02	8.000000E-02	-1.000000E-02	0..0	0..0	0..0
45	6	0..0	-1.000000E-01	6.000000E-02	1.000000E-02	0..0	0..0	0..0
46	6	0..0	-2.000000E-01	7.000000E-02	1.000000E-02	0..0	0..0	0..0
47	6	0..0	-4.000000E-02	-6.000000E-02	0..0	0..0	0..0	0..0
48	6	0..0	-3.000000E-03	-4.000000E-03	0..0	0..0	0..0	0..0

ETGFVALU = 2.094734E+05

## REAL LIGAMENT NO.

POINT ID.	TYPE	T1	T2	T3	R1	R2
51	6	1.0	3.054013E-02	3.4705407E-03	-4.785407E-03	0.0
52	6	0.0	6.724098E-01	9.046446E-01	-6.857210E-03	0.0
53	6	0.0	1.436412E-01	1.521275E-02	-8.342946E-03	0.0
54	6	0.0	1.560072E-01	2.626832E-02	-7.457679E-03	0.0
55	6	0.0	1.713519E-01	2.939245E-02	-9.181165E-03	0.0
56	6	0.0	1.265590E-01	5.747793E-02	7.921546E-03	0.0
57	6	0.0	2.450775E-02	7.292445E-02	1.102870F-02	0.0
58	6	0.0	-8.573242E-02	8.122558E-02	1.240641E-02	0.0
59	6	0.0	-0.900535E-07	-9.244653E-05	0.0	0.0
60	6	0.0	-5.23644E-07	-1.397652E-04	-8.38935E-04	0.0
61	6	0.0	0.0	1.3566335E-03	-2.349492E-03	0.0
62	6	0.0	4.593704E-02	-1.339191E-04	-4.635547E-03	0.0
63	6	0.0	7.630984E-02	4.666504E-05	-9.318804E-03	0.0
64	6	0.0	1.411577E-01	1.381544E-02	-1.264795E-02	0.0
65	6	0.0	2.159431E-01	2.062975E-02	-1.441859E-12	0.0
66	6	0.0	2.793551E-01	3.339155E-02	-1.240924E-02	0.0
67	6	0.0	3.572293E-01	4.924541E-02	-6.294556E-03	0.0
68	6	0.0	4.537075E-01	6.537612E-02	3.2539071E-03	0.0
69	6	0.0	1.546417E-01	7.747294E-02	6.94407L-03	0.0
70	6	0.0	3.92442E-02	3.269733E-02	1.128887E-02	0.0
71	6	0.0	3.918107E-02	1.066019E-02	-9.379728E-07	0.0
72	6	0.0	8.62432E-02	1.002939F-02	-5.426556L-03	0.0
73	6	0.0	1.612491E-01	6.945455E-03	-1.312526E-02	0.0
74	6	0.0	2.650007E-01	1.607351E-02	-2.131057E-02	0.0
75	6	0.0	3.751125E-01	2.890931F-02	-2.61889E-02	0.0
76	6	0.0	4.601574E-01	4.523911E-02	-1.024147E-02	0.0
77	6	0.0	4.807559E-01	6.191455E-02	-1.914656E-02	0.0
78	6	0.0	4.737770E-01	7.274973E-02	-1.502727E-04	0.0
79	6	0.0	3.645912E-01	8.334304F-02	7.151379E-03	0.0
80	6	0.0	2.195260E-01	8.817259F-02	1.014973E-02	0.0
81	6	0.0	2.618924E-01	2.511197E-02	-2.2652JF-02	0.0
82	6	0.0	3.132043E-01	1.657913E-02	-3.12073AE-02	0.0
83	6	0.0	4.9442854E-01	2.445913F-02	-4.499581E-02	0.0
84	6	0.0	5.332720E-01	4.398444E-02	-5.053337E-02	0.0
85	6	0.0	9.031276E-01	7.357916E-02	-5.457010LE-02	0.0
86	6	0.0	1.000070E+00	9.060934E-02	-3.795675E-02	0.0
87	6	0.0	9.511562E-01	1.052522E-01	-1.577792E-02	0.0
88	6	0.0	7.903839E-01	9.312151E-02	1.019712F-03	0.0
89	6	0.0	5.077301E-01	9.448255F-02	7.409124E-03	0.0
90	6	0.0	-6.47233E-03	-1.590123E-05	0.0	0.0
91	6	0.0	-2.441496E-03	-4.12339E-04	-6.427409F-04	0.0
92	6	0.0	-5.442562E-04	-4.58134E-04	-1.0919273E-03	0.0
93	6	0.0	6.505665E-03	2.522497E-03	-3.470936E-03	0.0
94	6	0.0	8.715293E-03	1.431171E-03	-2.149733F-03	0.0
95	6	0.0	2.062497E-03	4.05497E-02	-2.556493E-03	0.0
96	6	0.0	4.226245E-02	1.943357F-02	-6.449417E-03	0.0
97	6	0.0	3.410544E-01	9.37423E-02	3.939352F-03	0.0
98	6	0.0	1.0882110E-01	8.71581E-02	1.06033AE-02	0.0
99	6	0.0	-5.553902E-01	8.441174E-02	9.54946E-03	0.0
100	6	0.0	-3.115280E-01	6.531896E-02	7.34537AF-03	0.0

ICENVALUF = 7.20355E+05

SOCIETY FOR THE HISTORY OF MEDICINE

SOCIETY FOR THE HISTORY OF MEDICINE

TYPE	ID.	TD.	R1	R2	R3	T4	T5	T6	T7	T8	T9
C	1	0.0	-5.425442E-02	-2.498544E-02	-2.720394E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	2	0.0	-4.332515E-02	-5.95E995E-04	-1.68241E-04	0.0	0.0	0.0	0.0	0.0	0.0
C	3	0.0	-1.415625E-01	4.22J821L-03	1.622414E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	4	0.0	-7.054419E-01	1.371251E-02	2.767764E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	5	0.0	-4.515297E-01	2.684149E-02	2.73A16F-02	0.0	0.0	0.0	0.0	0.0	0.0
C	6	0.0	-6.720354E-01	3.95455F-02	9.025186E-03	0.0	0.0	0.0	0.0	0.0	0.0
C	7	0.0	-4.921624E-01	4.015749E-02	-0.671512E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	8	0.0	-7.584576E-02	1.465652E-02	-5.066846E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	9	0.0	-7.730244E-01	-2.033254E-02	-4.0525494E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	10	0.0	9.053146E-03	5.497346E-04	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	11	0.0	6.595371E-03	3.147698E-04	9.932249E-04	0.0	0.0	0.0	0.0	0.0	0.0
C	12	0.0	0.0	-0.712294E-04	1.674355E-03	0.0	0.0	0.0	0.0	0.0	0.0
C	13	0.0	0.0	1.018969E-02	4.5053996E-03	0.0	0.0	0.0	0.0	0.0	0.0
C	14	0.0	0.0	2.175579E-03	1.0J1762E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	15	0.0	0.0	8.223956E-07	1.611494E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	16	0.0	0.0	1.75+375E-02	1.959332E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	17	0.0	0.0	2.797359E-02	1.481507E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	18	0.0	0.0	3.589389E-02	-1.98139E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	19	0.0	0.0	4.736771E-02	-3.29417E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	20	0.0	0.0	3.557349E-02	-2.2134E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	21	0.0	0.0	-4.19n24E-02	-0.34062E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	23	0.0	0.0	5.531365E-04	2.215595E-07	0.0	0.0	0.0	0.0	0.0	0.0
C	24	0.0	0.0	-5.696755E-04	4.012062E-03	0.0	0.0	0.0	0.0	0.0	0.0
C	25	0.0	0.0	4.403397E-03	7.310294E-03	0.0	0.0	0.0	0.0	0.0	0.0
C	26	0.0	0.0	7.743529E-02	1.118456E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	27	0.0	0.0	1.357871E-02	1.44738E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	28	0.0	0.0	2.1051083E-02	1.416794E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	29	0.0	0.0	2.779713E-02	2.557093E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	30	0.0	0.0	-3.997636E-01	-1.249158E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	31	0.0	0.0	-3.627314E-01	-3.9J61E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	32	0.0	0.0	1.497709E-02	-3.777502E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	33	0.0	0.0	-1.652790E-01	-1.659335E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	34	0.0	0.0	-2.934641E-01	-5.848d79E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	35	0.0	0.0	3.0J97535E-02	3.818157E-04	0.0	0.0	0.0	0.0	0.0	0.0
C	36	0.0	0.0	2.227723E-02	1.952972E-04	0.0	0.0	0.0	0.0	0.0	0.0
C	37	0.0	0.0	-3.0J25597E-04	-3.265597E-04	0.0	0.0	0.0	0.0	0.0	0.0
C	38	0.0	0.0	-4.941689E-02	7.310260E-03	0.0	0.0	0.0	0.0	0.0	0.0
C	39	0.0	0.0	1.114497E-01	1.56992AE-02	0.0	0.0	0.0	0.0	0.0	0.0
C	40	0.0	0.0	-2.0J332E-01	2.3316J9E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	41	0.0	0.0	-2.8J94745E-01	4.2A35699AE-02	0.0	0.0	0.0	0.0	0.0	0.0
C	42	0.0	0.0	-3.0J255C19E-01	2.3J1935E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	43	0.0	0.0	-1.201844E-01	2.974J99AE-03	0.0	0.0	0.0	0.0	0.0	0.0
C	44	0.0	0.0	-2.144511E-02	3.187J93E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	45	0.0	0.0	-1.396850E-01	-6.217491E-02	0.0	0.0	0.0	0.0	0.0	0.0
C	46	0.0	0.0	3.1577802E-02	-1.605875E-04	0.0	0.0	0.0	0.0	0.0	0.0
C	47	0.0	0.0	2.731655E-02	-2.15203E-04	0.0	0.0	0.0	0.0	0.0	0.0
C	48	0.0	0.0	-3.48J762F-02	7.171246F-03	0.0	0.0	0.0	0.0	0.0	0.0
C	49	0.0	0.0	-2.678474E-02	5.547447E-03	0.0	0.0	0.0	0.0	0.0	0.0

FIRENVALUE = 7.203E5E+05

## REAL GENERATOR NO.

POINT	ID.	TYPE	T1	T2	R1	R2	R3
51	C	24.0	-1.0376797E-01	1.323479E-02	7.697471E-03	0.0	
52	C	0.0	-1.6671706E-01	1.953331E-02	6.366713E-03	1.0	
53	C	0.0	-2.0427741E-01	2.023495E-02	2.445476E-04	0.0	
54	C	0.0	-1.812523E-01	2.47397E-02	-1.02984E-02	0.0	
55	C	0.0	-8.31042E-02	1.367573E-02	-2.118917E-02	0.0	
56	C	0.0	2.0817879E-02	-1.649275E-04	-1.92182E-02	0.0	
57	C	0.0	9.84744E-02	-3.181342E-02	1.361184E-02	1.0	
58	C	0.0	-2.0893109E-02	-6.97516E-02	7.54884E-02	0.0	
59	C	0.0	2.41370E-02	1.374553E-02	0.0	0.0	
60	C	0.0	2.66773E-02	1.369335E-02	3.023650E-03	0.0	
61	C	0.0	0.0	1.647071E-03	7.255454E-03	1.0	
62	C	0.0	-1.9515557E-02	6.710231E-03	4.522279E-02	0.0	
63	C	0.0	-7.277337E-02	1.594449E-02	3.344666E-03	0.0	
64	C	0.0	-4.0045302E-01	2.124146E-02	+1.15321E-04	0.0	
65	C	0.0	-1.655141E-01	4.5554429E-02	-6.732976E-03	0.0	
66	C	0.0	-6.073945E-02	2.672224E-02	-1.51417E-02	0.0	
67	C	0.0	2.492646E-02	1.914747E-02	-1.776502E-02	0.0	
68	C	0.0	8.599777E-02	4.172915E-03	-1.065180E-03	0.0	
69	C	0.0	-1.715871E-02	-2.526971E-02	3.496147E-02	0.0	
70	C	0.0	-2.353945E-01	-5.663149E-02	4.787484E-02	0.0	
71	C	0.0	1.712567E-02	1.265079E-02	3.742406E-04	0.0	
72	C	0.0	2.4273677E-02	1.294224E-02	1.173811E-12	0.0	
73	C	0.0	1.451629E-02	2.297244E-02	-2.153490E-03	0.0	
74	C	0.0	1.5535361E-12	3.453522E-02	-8.171243E-02	0.0	
75	C	0.0	4.0523174E-02	3.660954E-02	-1.787179E-02	0.0	
76	C	0.0	1.6563695E-01	3.455225E-02	-1.43712E-02	0.0	
77	C	0.0	1.4428602E-01	3.4811942E-02	-1.016325E-02	0.0	
78	C	0.0	8.0417389E-02	1.537538E-02	2.114369E-02	0.0	
79	C	0.0	-1.4485183E-01	-1.517409E-02	5.245024E-02	0.0	
80	C	0.0	-2.0433991E-01	-3.744434E-02	7.306877E-02	0.0	
81	C	0.0	5.042198E-01	8.4222933E-02	-2.200574E-02	0.0	
82	C	0.0	4.920545E-01	7.247439E-02	-7.162994E-02	0.0	
83	C	0.0	2.557201E-01	4.177370E-02	-4.260774E-02	0.0	
84	C	0.0	6.0325687E-01	9.572473E-02	4.308538E-02	0.0	
85	C	0.0	7.421242E-01	1.170442E-01	-4.665238E-02	0.0	
86	C	0.0	9.5244697E-01	1.220239E-01	-1.961525E-02	0.0	
87	C	0.0	4.284373E-01	9.432395E-02	2.496670E-02	0.0	
88	C	0.0	5.995770E-01	7.266474E-02	6.555269E-02	0.0	
89	C	0.0	-5.35966E-01	-1.873763E-02	7.861570E-02	0.0	
90	C	0.0	3.0427199E-02	5.512242E-04	0.0	0.0	
91	C	0.0	-1.80959E-02	3.509295E-02	4.286950E-03	0.0	
92	C	0.0	3.23225E-02	2.572473E-02	4.0286961E-03	0.0	
93	C	0.0	8.232925E-02	2.587952E-02	9.064571E-03	0.0	
94	C	0.0	-6.817357E-02	4.914370E-02	7.4493574E-03	0.0	
95	C	0.0	-6.121259E-02	2.941925E-03	1.474188E-02	0.0	
96	C	0.0	-4.515894E-02	1.26549E-02	4.450674E-02	0.0	
97	C	0.0	-8.133970E-01	-8.5244989E-02	5.061123E-02	0.0	
98	C	0.0	-3.65491E-01	-6.150494E-02	4.665191E-02	0.0	
99	C	0.0	6.1165237E-01	-7.736531E-02	3.781044E-02	0.0	
100	C	0.0	1.006080E+00	-9.243619E-02	4.245559E-02	0.0	

$$F1GENVNLUF = 8.120917E+05$$

## REFAL FIVENATOR NO.

PRINT ID.	TYPE	T1	T2	T3	RL	R2	R3
1	C	J..1	U..U	'2.643971E-03	-4.256512F-04	3.886738E-04	0.0
2	C	0..0	0..0	-6.641309E-04	-4.32972F-04	3.063942E-04	0.0
3	C	0..0	0..0	-5.74910E-03	-7.952004E-04	9.752004E-04	0.0
4	C	0..0	0..0	-1.019603E-02	6.15563F-04	2.434929E-07	0.0
5	C	0..0	0..0	-4.675139E-02	1.011732E-02	4.173677E-03	0.0
6	C	0..0	0..0	-9.013794E-02	0.97554J-03	3.752166F-07	0.0
7	C	0..0	0..0	-8.813712E-02	6.370541E-03	-1.021272F-03	0.0
8	C	0..0	0..0	-3.718762E-02	5.997935LE-03	-8.552765E-03	0.0
9	C	0..0	0..0	3.012110E-02	5.312949E-02	-4.406654F-03	0.0
10	C	0..1	0..0	5.006649L-04	5.449545F-07	1.03645JE-02	0.0
11	C	0..0	0..0	1.0128572E-13	7.59554J-05	1.03645JE-02	0.0
12	C	0..0	0..0	9.177483E-04	7.983059E-05	1.248175E-14	0.0
13	C	0..0	0..0	0..0	-5.348015F-05	2.005470F-04	0.0
14	C	0..0	0..0	-7.469745E-03	1.132233E-04	0.04092L-04	0.0
15	C	0..0	0..0	-1.0645604E-02	1.064517F-04	1.529892L-03	0.0
16	C	0..0	0..0	-2.707423E-02	7.552235E-04	2.817527E-03	0.0
17	C	0..0	0..0	-5.3223L-02	1.301121E-03	3.540677E-03	0.0
18	C	0..0	0..0	-7.63492E-02	3.565516F-03	1.274094E-03	0.0
19	C	0..0	0..0	-6.221023E-02	5.340378F-03	-4.4510485E-03	0.0
20	C	0..0	0..0	3.453236E-03	6.47554F-03	0.9524005E-02	0.0
21	C	0..0	0..0	0.030608E-02	7.969313E-03	-6.55500AE-04	0.0
22	C	0..0	0..0	-2.0357927E-02	1.312397L-C2	2.575517E-02	0.0
23	C	0..0	0..0	2.0004814E-03	1.451045E-04	3.0	0.0
24	C	0..0	0..0	1.9564791L-03	0.477637E-05	0.377400F-04	0.0
25	C	0..0	0..0	0..0	-5.296753F-05	5.464070E-04	0.0
26	C	0..0	0..0	0..0	2.0480511F-04	1.150597E-J3	0.0
27	C	0..0	0..0	0..0	2.261637F-04	2.072349F-03	0.0
28	C	0..0	0..0	-3.717826E-02	1.232447F-02	3.142443E-03	0.0
29	C	0..0	0..0	-6.031854E-02	1.694029E-03	2.39746AF-13	0.0
30	C	0..0	0..0	-6.396399E-02	2.525171F-02	-1.377501F-03	0.0
31	C	0..0	0..0	-2.423242E-02	4.742394F-03	-8.18543C-13	0.0
32	C	0..0	0..0	5.171474E-02	8.41593F-03	-8.979417E-03	0.0
33	C	0..0	0..0	7.952006E-02	1.326073F-02	5.991112F-03	0.0
34	C	0..0	0..0	-4.9046182E-02	2.169567E-02	3.370147E-02	0.0
35	C	0..0	0..0	5.5875147E-13	3.285844L-04	0..0	0.0
36	C	0..0	0..0	4.077383E-03	1.476172E-04	5.191817E-04	0.0
37	C	0..0	0..0	0..0	-1.930275E-04	1.093175F-03	0.0
38	C	0..0	0..0	-9.053741E-03	9.072518F-04	1.637067E-13	0.0
39	C	0..0	0..0	-2.455929E-02	7.635737E-14	2.967515E-13	0.0
40	C	0..0	0..0	-4.94613L-02	2.761125F-14	3.178684F-03	0.0
41	C	0..0	0..0	-6.234191F-02	-1.069363E-04	2.323000E-04	0.0
42	C	0..0	0..0	-4.095923E-02	1.091492E-03	-6.164744F-03	0.0
43	C	0..0	0..0	2.617022E-02	5.169726F-03	-1.0238881E-12	0.0
44	C	0..0	0..0	1.067397E-01	1.32657E-J2	-8.055382F-03	0.0
45	C	0..0	0..0	9.02516L-02	1.306393L-U2	1.711172E-02	0.0
46	C	0..0	0..0	-7.630812E-02	2.095777F-12	2.571760F-02	0.0
47	C	0..0	0..0	1.013829E-02	5.377949E-04	0..0	0.0
48	C	0..0	0..0	4.299854E-04	4.655477E-04	1.155160E-03	0.0
49	C	0..0	0..0	0..0	4.731415F-04	1.943452L-03	0.0
50	C	0..0	0..0	-9.01533J/E-07	6.369455E-04	7.755005E-03	0.0

LICENSE NUMBER = A.120999E+05

## REFAL LIGENENTOR NO.

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	0.0	-4.716799E-02	-1.10883245E-02	4.6743A3F-07	0.0	0.0
62	G	0.0	-6.828869E-02	-7.316385E-02	2.57396E-02	0.0	0.0
63	G	0.0	-5.49549E-02	-4.042595E-02	-7.60194E-02	0.0	0.0
54	G	0.0	-6.533056E-03	-5.415745E-04	-1.256647E-02	0.0	0.0
55	G	0.0	9.652073E-02	9.097769E-03	-1.07489A7E-02	0.0	0.0
56	G	0.0	1.71909E-01	2.129426E-02	-2.943747E-02	0.0	0.0
57	G	0.0	1.6314017E-01	2.943017E-02	2.257350E-02	0.0	0.0
58	G	0.0	-1.19445E-01	1.971779E-02	3.021096E-J2	0.0	0.0
59	G	0.0	1.212477E-02	-9.102714E-05	0.0	0.0	0.0
60	G	0.0	9.565494E-03	-3.757375E-04	1.468415E-03	0.0	0.0
61	G	0.0	1.0	-1.969111E-02	3.412651E-03	0.0	0.0
62	G	0.0	-2.229527E-02	1.191527E-04	5.927261E-02	0.0	0.0
63	G	0.0	-4.343101E-02	-7.735490E-02	6.757742E-03	0.0	0.0
64	G	0.0	-1.016746E-01	-1.075672E-02	9.12765E-04	0.0	0.0
65	G	0.0	-6.442316E-02	-1.152554E-02	-9.7373FE-03	0.0	0.0
66	G	0.0	4.64944E-02	-1.054949E-03	-2.149551E-02	0.0	0.0
67	G	0.0	1.025981E-01	1.584157E-02	-2.293567E-02	0.0	0.0
68	G	0.0	2.6795624E-01	3.387659E-02	-2.740803E-03	0.0	0.0
69	G	0.0	1.194412E-01	4.05474E-02	2.114659E-02	0.0	0.0
70	G	0.0	-1.424637E-01	3.164494E-02	4.566517E-02	0.0	0.0
71	G	0.0	-7.025235E-02	-7.907255E-03	1.723151E-12	0.0	0.0
72	G	0.0	-1.35170E-01	-2.103759E-02	-3.167232E-04	0.0	0.0
73	G	0.0	-1.869072E-01	-2.361304E-02	8.474299E-03	0.0	0.0
74	G	0.0	-1.7690996E-01	-2.876709E-02	-2.921393E-03	0.0	0.0
75	G	0.0	-6.795522E-02	-2.058599E-02	-2.17746E-02	0.0	0.0
76	G	0.0	1.322514E-01	6.310379E-04	-3.0496521E-02	0.0	0.0
77	G	0.0	3.266720E-01	5.7941715E-02	-2.965244E-02	0.0	0.0
78	G	0.0	0.5338909E-01	5.267397E-02	2.196714F-03	0.0	0.0
79	G	0.0	1.46974E-01	5.722913E-01	3.877895E-02	0.0	0.0
80	G	0.0	-1.0715302E-01	5.458897E-02	2.862395E-02	0.0	0.0
81	G	0.0	-1.008000E+00	-1.561875E-01	4.461359E-02	0.0	0.0
82	G	0.0	-9.025504E-01	-1.391095E-01	5.17778AE-02	0.0	0.0
83	G	0.0	-9.27935E-01	-1.341109E-01	2.480084E-02	0.0	0.0
84	G	0.0	-6.58068E-01	-1.30172E-01	-2.58474E-02	0.0	0.0
85	G	0.0	-9.274648E-01	-7.576613E-02	-4.749431E-02	0.0	0.0
86	G	0.0	5.394505E-01	-3.088851E-02	-9.439055E-02	0.0	0.0
87	G	0.0	8.229810E-01	1.061524F-01	-4.316n6E-02	0.0	0.0
88	G	0.0	6.437174E-01	1.091936F-01	2.713997E-02	0.0	0.0
89	G	0.0	3.045584E-01	7.970770E-02	5.51752E-02	0.0	0.0
90	G	0.0	1.244931E-01	-2.47126E-04	0.0	0.0	0.0
91	G	0.0	9.691557E-01	6.4390477E-04	1.266979E-02	0.0	0.0
92	G	0.0	1.127945E-01	9.691555E-04	5.624249E-03	0.0	0.0
93	G	0.0	-1.088166E-01	-7.703225E-03	4.756575E-03	0.0	0.0
94	G	0.0	-1.780744E-01	6.729313E-04	3.786129E-02	0.0	0.0
95	G	0.0	-2.312192E-01	-3.902276E-03	7.347649E-03	0.0	0.0
96	G	0.0	-5.317368E-02	-2.952367E-03	7.346564E-03	0.0	0.0
97	G	0.0	-2.903496E-01	1.211750E-02	4.584274E-02	0.0	0.0
98	G	0.0	-1.855496E-01	1.362614E-02	4.4338AF-02	0.0	0.0
99	G	0.0	-9.942440E-03	2.17615E-02	3.403250E-02	0.0	0.0
100	G	0.0	3.19549E-02	2.149421E-02	7.426294E-03	0.0	0.0

**ETCENVALUE** = 1.767350L+06

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POINT ID.	TYPE	EASTING		NORTHING		ELEVATION	
		X	Y	X	Y	Z	M
1	G	1.000	0.000	-2.70291E-01	1.345182E-01	0.0	0.0
	C	1.000	0.000	-6.97328E-02	2.654123E-02	0.0	0.0
2	G	1.000	0.000	-3.24631E-03	3.927687E-03	0.0	0.0
	C	1.000	0.000	9.667759E-04	7.875235E-14	0.0	0.0
3	G	1.000	0.000	1.17535E-02	2.099206E-04	0.0	0.0
	C	1.000	0.000	1.45582E-03	-2.559985E-04	0.0	0.0
4	G	1.000	0.000	8.24771E-04	-7.232749E-04	0.0	0.0
	C	1.000	0.000	1.912359E-03	-6.692772E-04	0.0	0.0
5	G	1.000	0.000	-1.853317E-04	3.211325E-04	0.0	0.0
	C	1.000	0.000	5.002252E-05	-7.854E7E-04	0.0	0.0
6	G	1.000	0.000	-2.478750E-04	0.0	0.0	0.0
	C	1.000	0.000	-7.807511E-04	-4.749422E-04	0.0	0.0
7	G	1.000	0.000	-2.690963E-03	-1.147466E-03	0.0	0.0
	C	1.000	0.000	1.741289E-07	2.75329E-14	0.0	0.0
8	G	1.000	0.000	7.727917E-04	2.152772E-04	0.0	0.0
	C	1.000	0.000	7.415421E-04	2.152772E-04	0.0	0.0
9	G	1.000	0.000	8.515759E-04	-7.57064E-05	0.0	0.0
	C	1.000	0.000	8.1233975E-04	-4.277191E-04	0.0	0.0
10	G	1.000	0.000	5.292532E-04	-6.926598E-04	0.0	0.0
	C	1.000	0.000	4.672374E-05	-2.5921AE-04	0.0	0.0
11	G	1.000	0.000	4.672374E-07	4.672374E-05	0.0	0.0
	C	1.000	0.000	-6.294944E-05	5.788103E-04	0.0	0.0
12	G	1.000	0.000	7.406577E-04	5.1939639E-04	0.0	0.0
	C	1.000	0.000	5.239225E-04	5.239225E-04	0.0	0.0
13	G	1.000	0.000	5.12942F-04	1.920646E-04	0.0	0.0
	C	1.000	0.000	5.37175E-04	6.263730E-04	0.0	0.0
14	G	1.000	0.000	7.388674E-04	3.14219E-04	0.0	0.0
	C	1.000	0.000	5.51452E-04	1.94646A3E-04	0.0	0.0
15	G	1.000	0.000	5.151945E-04	4.029348E-05	0.0	0.0
	C	1.000	0.000	6.484954E-04	-2.297741E-04	0.0	0.0
16	G	1.000	0.000	5.557564E-04	-5.049222E-04	0.0	0.0
	C	1.000	0.000	7.066674E-04	-5.049222E-04	0.0	0.0
17	G	1.000	0.000	3.439905E-03	9.236155E-05	0.0	0.0
	C	1.000	0.000	5.310111E-03	9.580446E-05	0.0	0.0
18	G	1.000	0.000	4.0557413E-03	7.350431E-05	0.0	0.0
	C	1.000	0.000	-1.825784E-03	4.297914E-04	0.0	0.0
19	G	1.000	0.000	1.0526446E-03	4.1641249E-04	0.0	0.0
	C	1.000	0.000	-1.637295E-03	1.0785145E-14	0.0	0.0
20	G	1.000	0.000	-1.013997E-03	-1.013997E-04	0.0	0.0
	C	1.000	0.000	-2.370582E-04	1.41057E-04	0.0	0.0
21	G	1.000	0.000	-2.871118E-07	7.324147E-04	0.0	0.0
	C	1.000	0.000	4.537172E-04	-1.339764E-04	0.0	0.0
22	G	1.000	0.000	-3.527324E-04	4.493101E-04	0.0	0.0
	C	1.000	0.000	2.779221E-03	7.618790E-04	0.0	0.0
23	G	1.000	0.000	5.476991E-07	1.825753E-04	0.0	0.0
	C	1.000	0.000	6.271739E-05	4.124951F-04	0.0	0.0
24	G	1.000	0.000	4.0228349E-04	1.590933E-04	0.0	0.0
	C	1.000	0.000	-9.74772E-04	5.474569E-04	0.0	0.0
25	G	1.000	0.000	5.0337522E-04	3.952672E-05	0.0	0.0
	C	1.000	0.000	-1.279941E-05	7.249777E-05	0.0	0.0
26	G	1.000	0.000	4.0000397E-04	-4.491101E-04	0.0	0.0
	C	1.000	0.000	2.807377E-05	2.807377E-05	0.0	0.0

FIGURE NO. = 1.757355E+06

## REAL ELEMENT GENERATOR NO.

6

POINT NO.	TYPE	T1	T2	T3	R1	R2	R3
51	C	0.0	0.0	-4.303715E-04	2.412269E-04	-9.31322E-05	0.0
52	C	0.0	0.0	2.881433E-04	2.771732E-04	-2.46272E-04	0.0
53	C	0.0	0.0	2.883434E-04	2.762479E-04	-4.011344E-04	0.0
54	C	0.0	0.0	5.047745E-04	1.374213E-04	-3.0735759E-04	0.0
55	C	0.0	0.0	5.9275745E-04	2.35599d1E-05	1.3277485E-05	0.0
56	C	0.0	0.0	7.0117233E-03	-1.478640E-04	6.017274E-04	0.0
57	C	0.0	0.0	-1.0532902E-04	-5.369742E-05	2.436792E-04	0.0
58	C	0.0	0.0	1.0271763E-04	4.946067E-04	-1.926377E-04	0.0
59	C	0.0	0.0	3.0752478E-04	-4.5167332E-06	0.0	0.0
60	C	0.0	0.0	2.042741E-04	2.0508952E-07	3.782769E-07	0.0
61	C	0.0	0.0	0.0	2.255551E-05	2.0764730E-05	0.0
62	C	0.0	0.0	0.0	6.345543E-05	-1.0512352E-05	0.0
63	C	0.0	0.0	9.011457E-04	8.762944E-05	-1.081744E-04	0.0
64	C	0.0	0.0	2.6656/10E-03	1.27193E-04	-3.769221E-04	0.0
65	C	0.0	0.0	5.0472165E-04	1.069039E-04	-3.672976E-04	0.0
66	C	0.0	0.0	6.0311422E-03	6.557349E-05	-2.720166E-05	0.0
67	C	0.0	0.0	4.664498E-04	-2.584679E-04	5.542912E-04	0.0
68	C	0.0	0.0	7.059306E-04	-5.700563E-04	6.63742E-04	0.0
69	C	0.0	0.0	-8.057901E-04	-5.20494E-04	6.0356713E-04	0.0
70	C	0.0	0.0	1.06960E-04	-3.711442E-05	-4.753800E-04	0.0
71	C	0.0	0.0	1.015691E-04	-4.259272E-05	-2.13944E-05	0.0
72	C	0.0	0.0	3.040657E-04	-3.865543E-05	-1.544509E-04	0.0
73	C	0.0	0.0	1.092531E-03	-1.713523E-04	-3.410190E-04	0.0
74	C	0.0	0.0	4.0272952E-03	-7.923925E-03	-4.201937E-04	0.0
75	C	0.0	0.0	6.3344679E-03	7.05591E-06	-1.920457E-04	0.0
76	C	0.0	0.0	5.0147178E-04	-6.670452E-04	5.016922E-04	0.0
77	C	0.0	0.0	5.026995E-04	-1.017621E-03	1.51572E-04	0.0
78	C	0.0	0.0	-3.437333E-04	-1.0554183E-03	5.359097E-04	0.0
79	C	0.0	0.0	-2.546172E-03	-1.6655585E-03	-2.750792E-04	0.0
80	C	0.0	0.0	1.528419E-04	-1.219945E-03	-1.047329E-03	0.0
81	C	0.0	0.0	-1.01577E-02	-2.576557E-03	1.604724E-04	0.0
82	C	0.0	0.0	-9.726395E-03	-2.304167E-02	7.364476E-05	0.0
83	C	0.0	0.0	-7.051119E-03	-1.0747651E-03	-7.372294E-04	0.0
84	C	0.0	0.0	1.034730E-03	-1.122452E-02	-5.513443E-05	0.0
85	C	0.0	0.0	-7.039410E-03	-1.399279E-02	2.0000A07E-03	0.0
86	C	0.0	0.0	-1.616444E-02	-3.649174E-03	3.222899E-03	0.0
87	C	0.0	0.0	-2.0343325E-02	-5.337075E-03	2.079823E-03	0.0
88	C	0.0	0.0	-1.0801539E-02	-4.0334629E-03	-4.6729nac-05	0.0
89	C	0.0	0.0	-5.105434E-03	-2.478785E-02	-6.431485E-04	0.0
90	C	0.0	0.0	4.015993E-04	-1.287413E-05	0.0	0.0
91	C	0.0	0.0	3.078951E-04	2.555554E-05	3.562883E-05	0.0
92	C	0.0	0.0	1.0823277E-05	5.7666335E-05	4.523794E-05	0.0
93	C	0.0	0.0	8.012691E-05	7.07664E-05	3.947195E-05	0.0
94	C	0.0	0.0	-9.612594E-04	2.04449E-04	7.29324E-05	0.0
95	C	0.0	0.0	-3.534754E-04	1.324277E-04	8.72978E-05	0.0
96	C	0.0	0.0	1.0391729E-04	6.9191365E-05	-0.273285E-05	0.0
97	C	0.0	0.0	6.071024E-03	8.013353E-04	-5.091335E-04	0.0
98	C	0.0	0.0	2.709325E-03	7.238471E-04	-4.27261E-04	0.0
99	C	0.0	0.0	-4.0871197E-03	8.578777E-04	-4.73078E-04	0.0
100	C	0.0	0.0	-0.43125E-03	9.43619E-04	-5.564357L-04	0.0
101	C	0.0	0.0	0.0	0.0	0.0	0.0
102	C	0.0	0.0	0.0	0.0	0.0	0.0
103	C	0.0	0.0	0.0	0.0	0.0	0.0
104	C	0.0	0.0	0.0	0.0	0.0	0.0
105	C	0.0	0.0	0.0	0.0	0.0	0.0
106	C	0.0	0.0	0.0	0.0	0.0	0.0
107	C	0.0	0.0	0.0	0.0	0.0	0.0
108	C	0.0	0.0	0.0	0.0	0.0	0.0
109	C	0.0	0.0	0.0	0.0	0.0	0.0
110	C	0.0	0.0	0.0	0.0	0.0	0.0
111	C	0.0	0.0	0.0	0.0	0.0	0.0
112	C	0.0	0.0	0.0	0.0	0.0	0.0
113	C	0.0	0.0	0.0	0.0	0.0	0.0
114	C	0.0	0.0	0.0	0.0	0.0	0.0

NADC-73235-30

## Security Classification

## DOCUMENT CONTROL DATA - R &amp; D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

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13. ABSTRACT <p>A weight saving of 54 percent has been achieved in the in-house design and fabrication of a composite wing for the BQM-34E aerial target vehicle. Design criteria are identical to those of the 5g production metal wing. Results of the stress analyses indicate adequate margins of safety.</p>		

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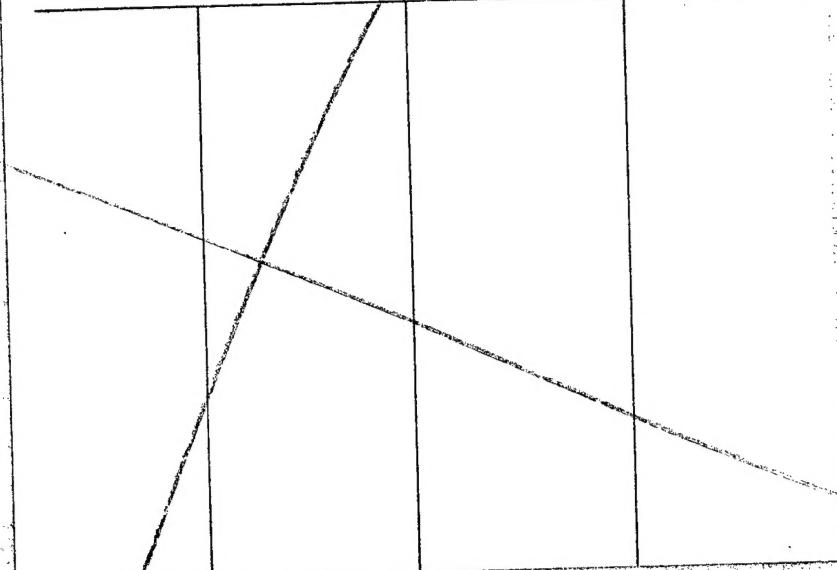
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CNM (MAT-031) . . . . .	1
NAVWPNSCEN, China Lake, Ca. (Code 4510) . . . . .	1
NAVMISCEN, Pt. Mugu, Ca. (Code 5160) . . . . .	1
NAVAIRDEVCECEN, Warminster, Pennsylvania 18974 . . .	21
(3 for 813)	
(3 for 30023)	
(1 for 03)	
(1 for 20)	
(1 for 30-8)	
(1 for 40)	
(1 for 50)	
(1 for 301)	
(1 for 302)	
(1 for 303)	
(5 for 3033)	
(1 for 304)	
(1 for 305)	

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